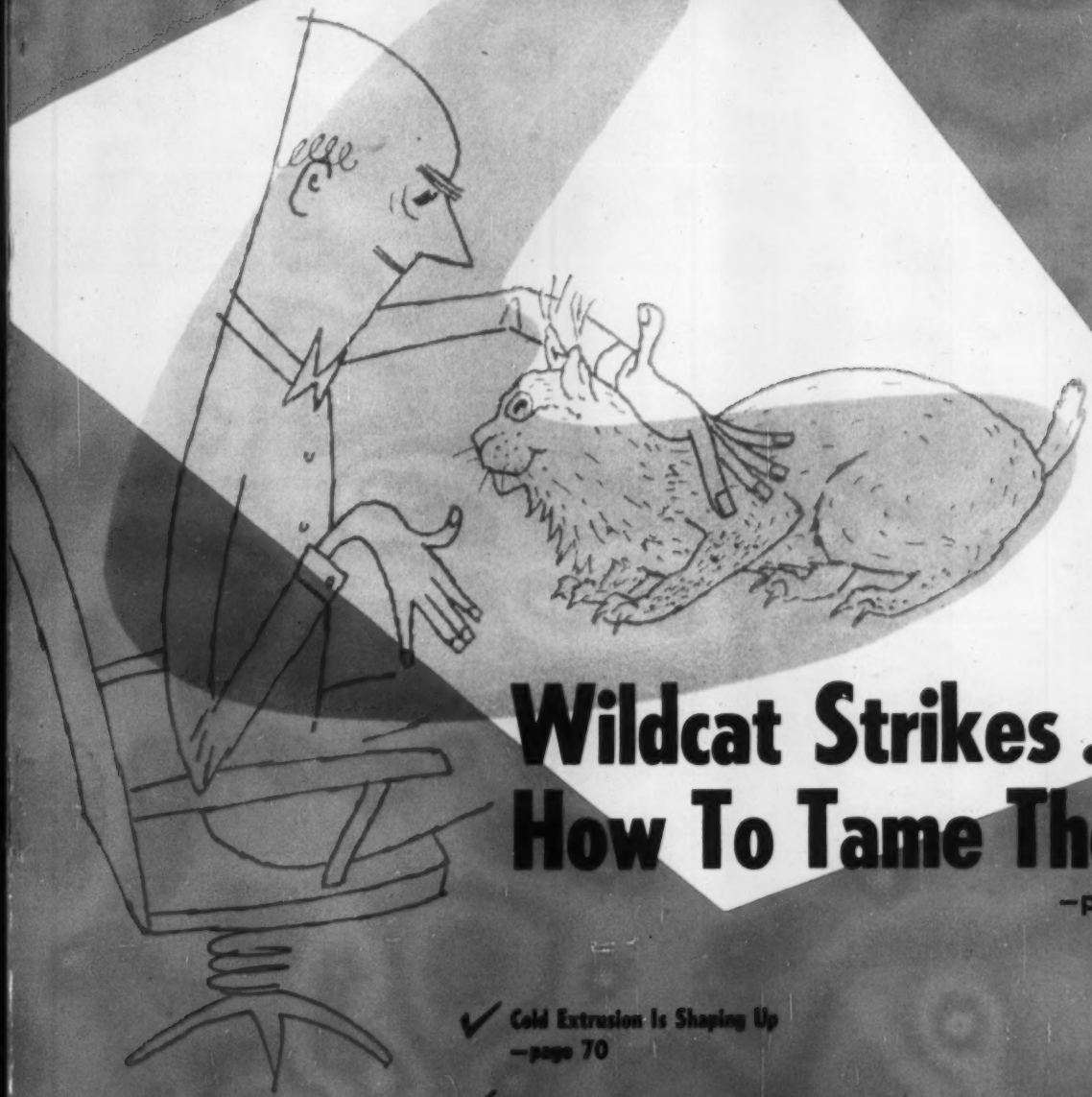
OCTOBER 3, 1955

STEEL
The Metalworking Weekly



Wildcat Strikes . . . How To Tame Them

—page 37

✔ Cold Extrusion Is Shaping Up
—page 70

✔ What Alloy for Investment Casting?
—page 72

CONTENTS — PAGE 5

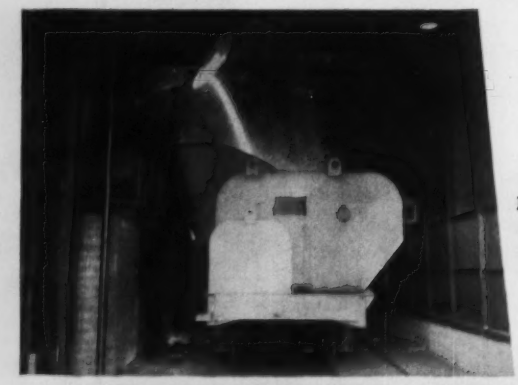
EC&M Control is Safe for Hot Metal Applications

Bessemer Converters operate *safely* under EC&M Control. This three-converter installation is typical of many EC&M controlled converters.

Wherever hot metal is stored, handled, or processed, many firms, acquainted with EC&M value, select this quality apparatus because of their confidence in it—in the engineering and experience which it represents.

Typical hot metal applications include (1) Ladle Cranes, (2) Hot Metal Cranes, (3) Hot Metal Mixers, (4) Bessemer Converters, (5) Storage Vessels, (6) Ladle Cars—where only tried and true equipment, which represents the utmost in safety and dependability, is acceptable.

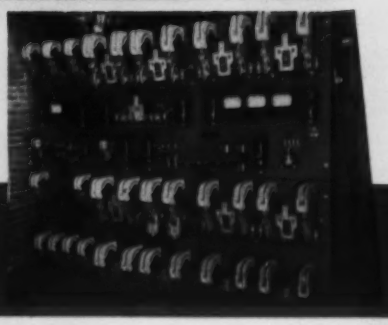
Listed below are a few of the EC&M products especially designed for the requirements of hot metal service. They have proved themselves highly successful in many applications throughout the years. Specify EC&M Control for hot metal applications.



Hot metal mixer pouring into hot metal car, both of which are operated by EC&M Control.

EC&M power-circuit type Limit Stops mounted on hot metal mixer (shown above), provide positive slowdown and final stopping.

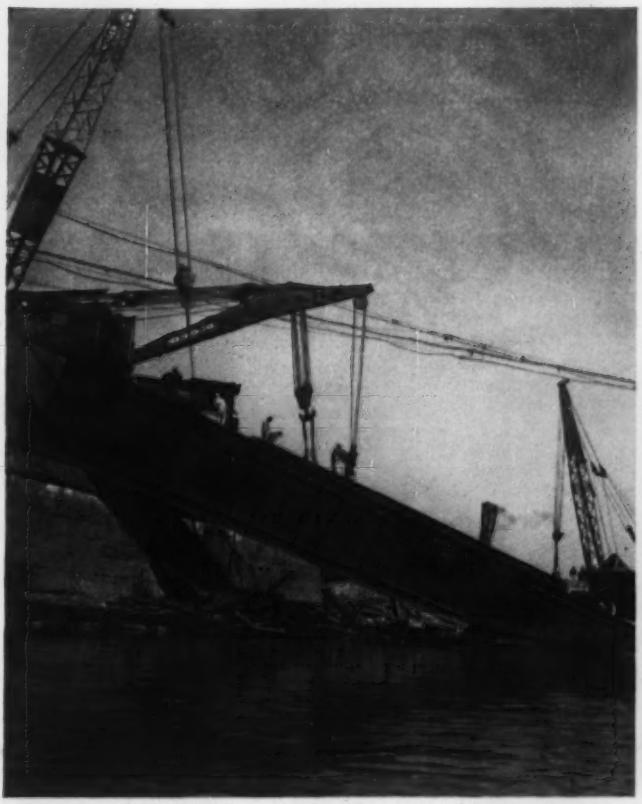
1. Basic Control Systems for Bessemers & Mixers, many originated by EC&M
2. Dead - Man's Master Switch
3. Air and Magnetically-released Brakes
4. Positive-type Limit Stops for Slowdown and Final Stopping
5. LINE-ARC Magnetic Contactor Controllers



LINE-ARC Contactor Control for the hot metal car propel-motion.

THE ELECTRIC CONTROLLER & MFG. CO.

4498 LEE ROAD • CLEVELAND 28, OHIO



SALVAGING GIRDERS FROM RIVER BED—At the wrecked Naugatuck River Bridge of the New York, New Haven and Hartford Railroad at Waterbury, Conn., girders are being salvaged from the river bed. We rushed approximately 500 ft of wire rope to Waterbury for this operation.

NEW BRIDGE ON PENNSYLVANIA'S ROUTE 11—This emergency bridge will carry Route 11 over Spring Brook Creek, south of Scranton. The new bridge is being built with Bethlehem H-piling and structural steel.

Steel Rushed to Flooded Areas Aids Reconstruction Task

Even before the flood waters that followed Hurricane Diane had started to recede, we began to receive urgent calls for steel. Soon it was clear that immense quantities of steel would be quickly needed to relieve human distress and restore normal life and activities.

NEW BOX CULVERT FOR BOSTON AND ALBANY R. R.—When dams gave way near Springfield, Mass., the torrent washed out high railroad embankment. Note tracks (arrow). Bethlehem rushed 280 tons of steel reinforcing bars for new culvert, shown in foreground.

We saw that we could meet the acute need only by breaking into production schedules and utilizing the full facilities of Bethlehem plants and mill stocks. We were sure that any of our customers whose orders might be affected would approve our course.

So within a few hours the initial emergency shipments were on their way. Thousands of tons of structural shapes, piling, reinforcing bars and rails were rolled and rushed to the stricken areas. In some cases steel was rolled and shipped within hours after receipt of the order.

All major Bethlehem plants in the East have shared in meeting the flood emergency. Our plant at Bethlehem, Pa., largest producer of structural shapes in this country, was itself a flood casualty, but as the plant got back into operation its output also was made available to help in repairing flood damage.

But the task was one in which many companies shared. In this emergency, as in many another, in peacetime and in war, the steel industry has always been prepared to pitch in and deliver the materials needed to serve the national interest.

BETHLEHEM STEEL

BETHLEHEM STEEL

"bearing maintenance negligible"

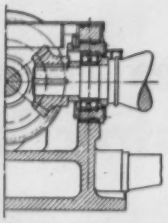
on UNITED®
Blooming and Slabbing Mill Tables
SKF EQUIPPED

That's the report from United Engineering and Foundry Company who first tried out SKF Spherical Roller Bearings on mill equipment more than 25 years ago . . . since then on blooming and slabbing mill tables.

Then it was an innovation; now it's a *trend!*

Pictured here are United Engineering and Foundry installations in three mills—all in service over two years.

Throughout the steel industry, SKF Spherical Roller Bearings are not only going into *new* mills, but are also replacing other types of bearings that have been tried and found wanting in existing mills.



APPLICATION — Drawing shows how designers apply SKF Spherical Roller Bearings to both approach and delivery tables of blooming mills like the United Engineering & Foundry installation at Granite City.

SIGNIFICANCE — Table roll bearings under the manipulators particularly must be able to take it—*heavy, intermittent radial load—thrust load—shock load!* SKF Spherical Roller Bearings stand up in this application and there is *no* "pounding-out" of housing bores.

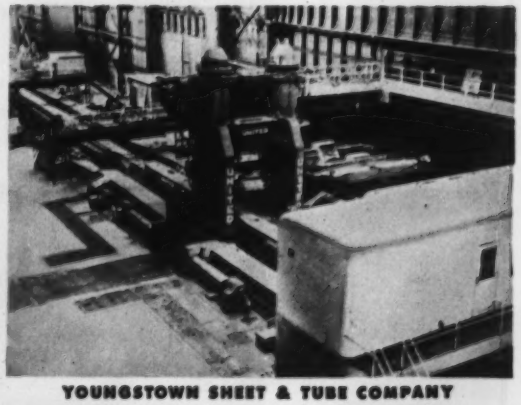
The three reasons that could make SKF Spherical Roller Bearings the answer to your anti-friction problems are:

1. Size for size, SKF Sphericals provide highest capacity.
2. Like all SKF bearings, they are made to the industry's highest quality standards.
3. SKF Field and Home Office Engineers, with many types and sizes of *ball* and *roller* bearings to choose from, can provide unbiased and sound advice on how and where to install what bearing. 7021

SKF INDUSTRIES, INC., PHILADELPHIA 32, PA., *manufacturers of* **SKF** *and* HESS-BRIGHT® *bearings.*

GRANITE CITY STEEL COMPANY

LONE STAR STEEL COMPANY



YOUNGSTOWN SHEET & TUBE COMPANY

SKF®

BALL AND ROLLER BEARINGS

No job too tough—No service too severe

MONARCH WHYTE STRAND Wire Rope

Put **MONARCH WHYTE STRAND** Wire Rope to the test on your equipment. It is built to give better service in the toughest going.

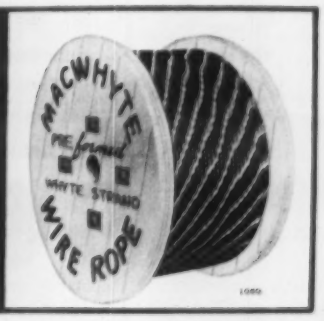
There is a Macwhyte Rope in the proper size and construction to meet every equipment need and every service condition. **WHYTE STRAND** Wire Rope is designed with the end use in mind . . . to provide the features that will give outstanding and economical service on your equipment.

MONARCH WHYTE STRAND is supplied in a *thousand and one* types, sizes, and grades. It is made Internally Lubricated, PREformed or non-PREformed, Lang Lay or Regular Lay, with Fiber Core or Independent Wire Rope core. Wire combinations in one single rope vary from *42* wires in 6 x *7* construction to *343* wires in 6 x 49 IWRC. **WHYTE STRAND** is made in all Wire Rope Classifications . . . so there is a *right* rope for every equipment need.

Write for MONARCH WHYTE STRAND Bulletin *5425*

For proper wire rope size and construction for your equipment, request a Macwhyte recommendation.

MACWHYTE WIRE ROPE



Gold mine refuse + World's greatest tank lining job = Uranium

URANIUM now is being recovered from the yellow mountains of slimes residue surrounding the gold mines on the Rand in South Africa. The process involves treatment of the abrasive, spent ore with sulfuric acid. No small problem was the protection of the many tanks, pumps and miles of piping from the twin attack of acid and abrasion. The answer was the world's largest sheet-rubber tank lining job.

A vital role in solving the many problems created by the sheer size and remoteness of the installations, plus subtropical heat and rains, was played by the G.T.M.—Goodyear Technical Man. Most important was his specification of PLIOWELD — especially compounded, acid- and abrasion-resistant rubber—and a *chemically curing* field procedure that eliminated sectionalized tanks or filling the tanks with hot water to vulcanize the rubber to the metal.

Over *six and one-half acres* of PLIOWELD have been used to protect equipment in this operation to date. Ultimately, some 1,250,000 square feet of tank surfaces, 50,000 feet of pipe and 1,000 pumps will be armored with rubber. How can PLIOWELD help you in your fight against corrosion? For details, see the G.T.M. or write: Goodyear, Industrial Products Division, Akron 16, Ohio.

Pliowold—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

PLIOWELD Tank Linings by

GOODYEAR

THE GREATEST NAME IN RUBBER

STEEL
The Metalworking Weekly

OCTOBER 3, 1955
Vol. 137 No. 14

METALWORKING OUTLOOK, 31

The Editor's Views, 35

Wildcat Strikes: How To Tame Them, 37
Growing problem needs more attention

Management at Work, 47
Motorola's Piper plays a tune with human relations

Green Means Go, 48
Traffic signal makers look for a bright future

Industrial Components: Supplies Easier, 49
Slight improvement coming, STEEL's survey shows

Windows of Washington, 44
Mirrors of Motordom, 51
The Business Trend, 55
Men of Industry, 59
New Products, 93
Behind the Scenes, 6
Letters to the Editors, 10
Calendar of Meetings, 25
Machine Topics, 84
New Literature, 99

TECHNICAL OUTLOOK, 69

Cold Extrusion Is Shaping Up, 70
It shortens steps from billet to finished product

What Alloy for Investment Casting? 72
A glance at the chart gives a fast answer

New Trend Shapes Up in Wire Annealing, 74
In and out in a hurry with continuous pusher furnace

One Every 3 Seconds, 76
How bumper plating keeps up with Chevrolet production

24,000 Shelves a Day, 86
Three transfer presses keep refrigerators rolling

Tight Rein on Inventory, 88
Mechanized paper work keeps track of things with less effort

MARKET OUTLOOK, 101

Steel Operations, 101
Price Comparisons, 102
Nonferrous Roundup, 104
Nonferrous Prices, 106
Steel Prices, begin 108
Scrap Prices, 126

Editorial & Business Staffs, 16. Advertising Index, 131. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 W. 39th St., New York 18, N.Y.

Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscription in the United States and its possessions, Canada, Mexico, Cuba, Central and South America, one year, $7.50; two years, $15; all other countries, one year, $20. Single copies (current issues), 50 cents. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland.
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SHOWS PROFITS SOONER

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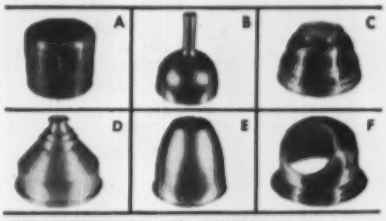
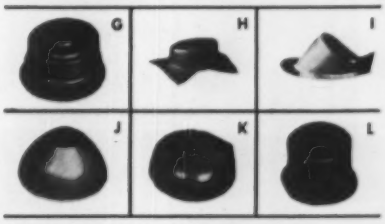


METAL SPINNING AND SPINFORMING:
Typical items: A—Aircraft detail; B—Handle lamp; C—Lamp shade; D—Lamp base; E—Electronic cover; F—Compass cover.



HYDROFORMING:
Typical items: G—Appliance cover; H—Jet engine detail; I—Aircraft detail; J—Jet engine detail; K—Cleaner cover; L—Motor housing.

ROLAND TEINER Company, Inc.
DEPT. 20-134 TREMONT STREET, EVERETT 49, MASS.
Telephone Everett 7-7800
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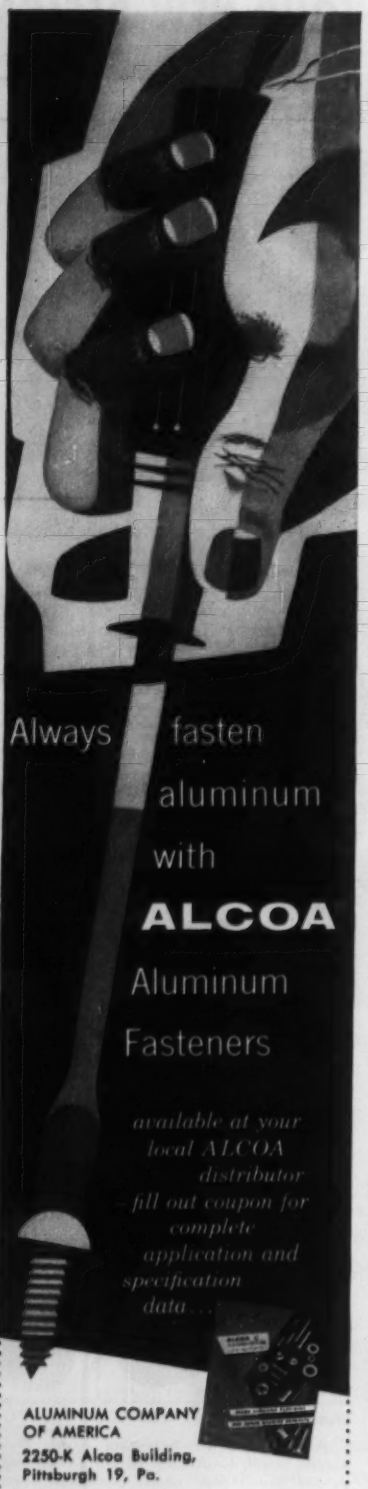


ALUMINUM COMPANY OF AMERICA
2250-K Alcoa Building,
Pittsburgh 19, Pa.

Gentlemen:
Please send complete specification data and samples of your aluminum fasteners.

Name _____
Title _____
Company _____
Address _____

behind the scenes

Hold That Wildcat

An indefatigable old Roman, name of Pliny, used to say that it was a sin to go through a whole day without learning something new. He learned so much himself he wore out droves of secretaries just dictating to them; when he wasn't dictating, he was making notes. He even made notes while sitting in his bath—which may or may not have inspired a modern manufacturer to devise a submarine fountain pen.

Well, all right. We figured it wouldn't do any harm to learn something new, so we investigated the background of the wildcat strike control story (page 37). The first step, of course, was to investigate the wildcat, per se, so naturally we turned to Elliot's, "Monograph of the Felidae" (London, 1878). This excellent work informs us that the wildcat has short intestines, and as far as we are concerned that's today's ration of additional learning.

When STEEL's editors assembled the story on wildcat strike control, they didn't consult Elliot at all; they consulted management, union officials, large and small manufacturers. Detroit Editor Floyd Lawrence stalked about the Motor City, pouncing like a lynx on every bit of pertinent information; the result is a categorical revelation of editorial findings aimed at wildcats. It is very interesting.

Slumber in Action

Last week STEEL carried an interesting item on innerspring mattresses and bedsprings. It had to be cut considerably because of space restrictions, but we eagerly latched on to the torn fragments.

"Average person," said the fragments, "spends more than 120 days in bed each year. Mattress designs are directed toward giving maximum conformity to contour of the body with equal pressure at all points."

Sleep comes so natural, the orthopedic approach toward slumber sort of makes you wonder. Our ancestors clear back to the flood must have been sprung completely out of shape by reason of sleeping in featherbeds, bedcords, hammocks, rock piles and trees. Their descendants, however, need never again battle with backache, twisted chassis, bowed dorsals or insomnia. Today, we are privileged to sleep on scientifically coiled steel; we may wake up refreshed, vigorous and straight as so many ramrods. All except the average person, that is. "The average person," said the fragments, "turns and twists 20 to 40 times a night, sleeping in 15 to 20 positions; few remain motionless as long as 1 hour."

Nearly 8 million bedsprings will be made this year, and if the above findings are true, those mattresses are going to take an awful beating.

Sales Story

Advertising Age quotes the Magazine Advertising Bureau (MAB) as saying that the dollar volume of measured national advertising increased more than four times since 1939. It went from $333 million to $1.5 billion—and that's a respectable amount of money to lay out for anything. The line that caught our attention, however, was this: Out of 71 companies that had discontinued magazine advertising, 52 had either gone out of business or have discontinued all forms of national advertising!

Turn to any of STEEL's advertising space at random; pick out any advertiser. If he has been in business for some time, he has spent more money this year in magazine advertising than he did last year—and 10 to 1 he enjoyed more gross business, too.

Hit That Line

Sometimes you can relax yourself by cooking up a missing thought. Take this banker limerick, and add the last line. We'll print the best one, and send a portrait of a banker to all contestants:

A banker of medium weight
Took a seat, but discovered too late
That while he was agile
The armchair was fragile,

. . . . . .

Shrdlu

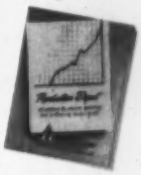
(Metalworking Outlook—Page 31)

You can spot productive hands by the company they keep!

Boost contour polishing with Behr-Manning abrasive belts!

WITH THESE MODERN COATED ABRASIVE applications on hand, you can produce superior finishes on tricky contours at record breaking speeds. The combination of flexible, even-cutting BEHR-MANNING abrasive belts and up-to-date methods make this possible. Test them on your parts — in your plant or in a nearby BEHR-MANNING Demonstration Room.

Write for the Production Digest Bulletin. Contains 60 pages of detailed data on coated abrasive grinding and polishing techniques. Address Behr-Manning, Troy, N. Y., Dept. S-10.



In Canada: Behr-Manning (Canada) Ltd., Brantford.
For Export: Norton Behr-Manning Overseas Inc., New Rochelle, N. Y., U. S. A.

Model CN-2 made by Engelberg-Huller Co., Syracuse, N. Y.

A favorite for dry fining and blending plumbing parts.

Smoothing the way to finer finishes on flat areas.

Tops for removing flash from difficult inside contours.

G-4

BEHR-MANNING division of NORTON Company

▲ COATED ABRASIVES ▲ SHARPENING STONES ▲ PRESSURE-SENSITIVE TAPES

NEW DAY COMING FOR WEIGHT-SAVERS!

For example . . . you can reduce the weight of a part as much as 44% with Republic Titanium, yet not sacrifice a single pound of tensile strength.

Or . . . if you require additional strength, use Republic Titanium to gain it without adding weight to the part.

You've probably thought of Titanium as "one of those rare metals only the aircraft industry can get . . . or afford." And that has been the case, in the past.

But Republic Steel and other producers of Titanium are steadily increasing their facilities, as well as improving their processes and products, looking toward the time when there should be Titanium for almost everybody. You'll be foresighted to learn now what Republic Titanium Alloys can do for your product, and you, tomorrow or a year from now . . . or perhaps as long as five years hence.

Republic Steel is an old hand at this high strength-to-weight business. For a quarter century we've been helping customers design and engineer strong steel alloys and stainless steel into parts that need more strength without extra "beef", or extra rigidity without excess pounds. That's why Republic can offer you unbiased recommendations on any metal problem. Where Republic Titanium will be best, we'll say so . . . where a Republic Alloy Steel or Stainless Steel will do the job better, that's our suggestion.

The coupon below will bring literature to give you a head start on Republic Titanium over competitors. Mail it today.

REPUBLIC STEEL

...ready with the answers to your strength-to-weight problems...

One man's problem may call for alloy steel . . . another's a stainless steel . . . and a third's a special carbon steel . . . all made by Republic. At Republic, we roll more types of steels and make more types of steel products than any other producer. From decades of experience with many problems and many fabrication processes, the Republic Technical Man can hand you the answer that meets your needs.

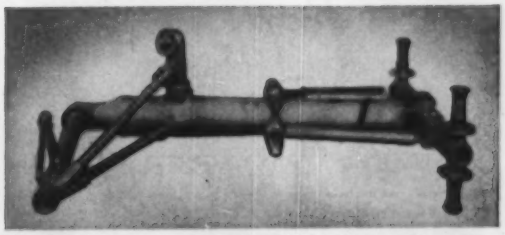
Whether your product must move lightly, stand still, look beautiful, or fight corrosion . . . the Republic Technical Man and his background of experience are prepared to serve you.

The coupon below will bring you information about Republic Titanium, Republic Stainless Steels, and Republic Alloy Steels.

REPUBLIC STEEL

World's Widest Range
of Standard Steels and Steel Products

LATEST FACTS ABOUT REPUBLIC TITANIUM



WHAM! EVER THINK OF THE TREMENDOUS STRAIN on the landing gear when the huge aircraft you are in hits the runway at high speed? Don't worry, the landing gear can take it. Republic Alloy Steels provide the high strength and toughness needed to withstand high impact and heavy loads in aircraft landing gear—provide the hardenability to resist wear on bearing surfaces.

REPUBLIC HIGH STRENGTH STRUCTURAL BOLTS provide a new, fast, economical way to fasten structures permanently. Bolting reduces noise. Replaces field riveting. Is often safer and easier than other methods. Work usually is done from within structure, eliminating costly scaffolding. Made in accordance with ASTM Spec. A325. Bolts marked for easy identification to conform to Spec. for Assembly of Structural Joints, 2-27-54, Research Council on Riveted and Bolted Construction.

SAVE UP TO 25% IN WEIGHT, EVEN 50% with Republic High Strength Steel. Yes, when you engineer earth moving equipment, truck and gasoline trailers, railroad cars, and other mobile equipment to take full advantage of the high strength, low weight and corrosion-resistance of Republic High Strength Steel, you can cut weight up to 50%. And you can lengthen equipment life, too.

REPUBLIC STEEL CORPORATION
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Cleveland 27, Ohio

Please send me more information on:

☐ Titanium ☐ High Strength Bolts
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A BETTER PRODUCT...

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FAIRFIELD GEARS

★ If GEARS are a vital part of the product you make, there is no finer recommendation for the QUALITY of your product than to be able to say it is equipped with "FAIRFIELD GEARS."

Long producers of the gears needed in high grade trucks and tractors, Fairfield now brings the same standards for GEAR PERFORMANCE to a wide variety of products: Agricultural Implements ... Power Shovels ... Machine Tools ... Diesel Locomotives ... Road Graders ... Lift Trucks ... Road Rollers ... Pump Drives ... Winches ... Military Vehicles ... and a host of others.

Fairfield's facilities are unexcelled. Here "under one roof" in a new and ultra modern plant designed especially for the purpose, Fairfield has everything needed for producing all kinds of gears: spur ... herringbone ... spiral bevel ... ground tooth spiral bevel...straight bevel...coniflex bevel...hypoid...zerol...worms and worm gears...splined shafts...differentials. Get acquainted with Fairfield's engineering and production facilities. Your inquiry will receive prompt attention. FAIRFIELD MANUFACTURING COMPANY, 2313 South Concord Road, Lafayette, Indiana.

Fine Gears Made to Order

FAIRFIELD

LAFAYETTE INDIANA

LETTERS
TO THE EDITORS

Editorial Tells Tale

Your editorial, "Cheers and Smears" (Aug. 1, page 33), was wonderful. I have been closely aware of the situation since I know both sides of the story regarding my uncle, Harold E. Talbott, the former secretary of the Air Force. I would like several copies to mail to my political and editorial friends.

George S. Greene Jr.
730 Spring Lane
Philadelphia

Series Stimulates Imagination

Congratulations on your 1955 Program for Management series. These articles stimulate the imagination and open doors to creative thinking. Because each member of our management group reads them, we would appreciate two copies of each article for our permanent management file. Please keep these informative articles coming!

Robert F. Kuemmerle
Pentagon Pattern & Engineering Co.
Chicago

Because of the interest created by these articles, I find they are removed by prior readers before I see our copy of STEEL. I would appreciate reprints for my own file.

Alex Treskov
Chief Industrial Engineer
Eastern Air Devices Inc.
Dover, N. H.

Interested in Expansion

We would like six copies of your article, "Big Expansion in Steel" (Sept. 5, page 41). We are vitally interested in the expected expansion in the steel industry over the next few years as portrayed in this article.

Charles Halcomb
Deputy Director
Iron & Steel Division
Business & Defense Services Administratic..
Department of Commerce
Washington

Magnesium Prices Compared

Although I've heard nothing but favorable comments about your story, "Magnesium: A Metal That's Going Places" (Sept. 5, page 46), I did notice a small error. The statement is made that the magnesium price level is "7 cents a pound above that of a year ago." Actually, the price level for primary is

(Please turn to page 12)

With 500 ft. frontage on a main transport artery, and with complete port and rail facilities nearby, this substantial plant offers unlimited opportunities for U.S. manufacturer desiring to establish in Canada.

Located in the heart of Ontario's rich market . . . close to metropolitan areas where over 40% of Canada's retail sales are made.

Included in the parcel:

— One, 6256 sq. ft., 2-storey, brick building including 4000 lb. capacity freight elevator.

— One, 11,480 sq. ft., single-storey brick building containing 7½-ton and 5-ton Overhead Cranes; and a 7400 sq. ft. adjoining building with floor-operated, standard overhead crane and indoor railway siding.

— One, 14,896 sq. ft. single storey brick building with 7½ ton overhead crane and outdoor rail siding.

— One, 2534 sq. ft. Brick Veneer and frame office building heated by oil-fired hot water system. Also 907 sq. ft. building suitable for time office, etc.

— One, 2684 sq. ft. frame garage.

— One, 1377 sq. ft. building for factory washrooms, etc.; and a 2013 sq. ft. wooden lean-to.

— 680 sq. ft. Boiler Room fully equipped; and Generating Room with complete motor generator set.

All services, including electricity, water, railway, caretaking, etc., ready for use. Price - $2,000,000.00.

For full particulars, write to Mr. D. A. Lindsey

READY FOR OCCUPANCY. Plant has been cleared, and purchaser may have immediate possession. Picture shows part of interior of large, single-storey steel truss brick building with 7½ ton overhead crane.

MODERN BRICK OFFICE faces main industrial paved thoroughfare. Centrally located, but with easy, fast access to all highways, port facilities, and neighbouring industry.

DOMINION FOUNDRIES AND STEEL LIMITED, Hamilton, Ontario, Canada

ALLOY
SPECIAL
WIRE SHAPES

Cut Costs . . .
Improve Product Performance

Alloy Special Wire Shapes reduce costly machining time and cut metal waste. No need to start with round wire and machine half of it away to get the shape you want. We can supply you with Stainless Steel and Nickel Alloy wire in just about any special shape you may require.

Drawn Alloy Wire Shapes provide other advantages in addition to reduced costs. Product quality and performance are also improved. The drawn wire insures uniformity of cross-section and a smooth, flaw-free surface.

Send today for information on Alloy Special Wire Shapes — and for our Nickel Alloy and Stainless Steel Properties Charts . . .

ALLOY METAL WIRE DIVISION

HKP H. K. PORTER COMPANY, INC.
Prospect Park, Pennsylvania

LETTERS

(Concluded from page 10)

5½-cents above the level of a year ago. Standard grade sheet is 5 cents higher.

Clayton L. Dickey
Public Relations Dept.
Dow Chemical Co.
Midland, Mich.

Business Trends in Column

Enjoyed the sixth article in STEEL's ten-part 1955 management series, "Business Trends: Put Them to Work" (July 18, page 93). May I reprint parts of it? I would like to use the material as part of my daily column.

George Triff Jr.
Business-Finance Editor
Peoria Star
Peoria, Ill.

• *Permission granted.*

Source of Information?

You did a fine and comprehensive job on the story, "Beyond the Metals," Part I (Aug. 1, page 72), but there is one question concerning the chart of thermal conductivities of superrefractories (page 74). I would like to know where you got this information. It doesn't seem to agree with information we have developed, or any we have seen.

H. T. Pierpont Jr.
Sales Manager
Refractories Division
Norton Co.
Worcester, Mass.

• *The chart is an average of values obtained from graphs prepared by Norton Co., Carborundum Co. and Battelle Memorial Institute.*

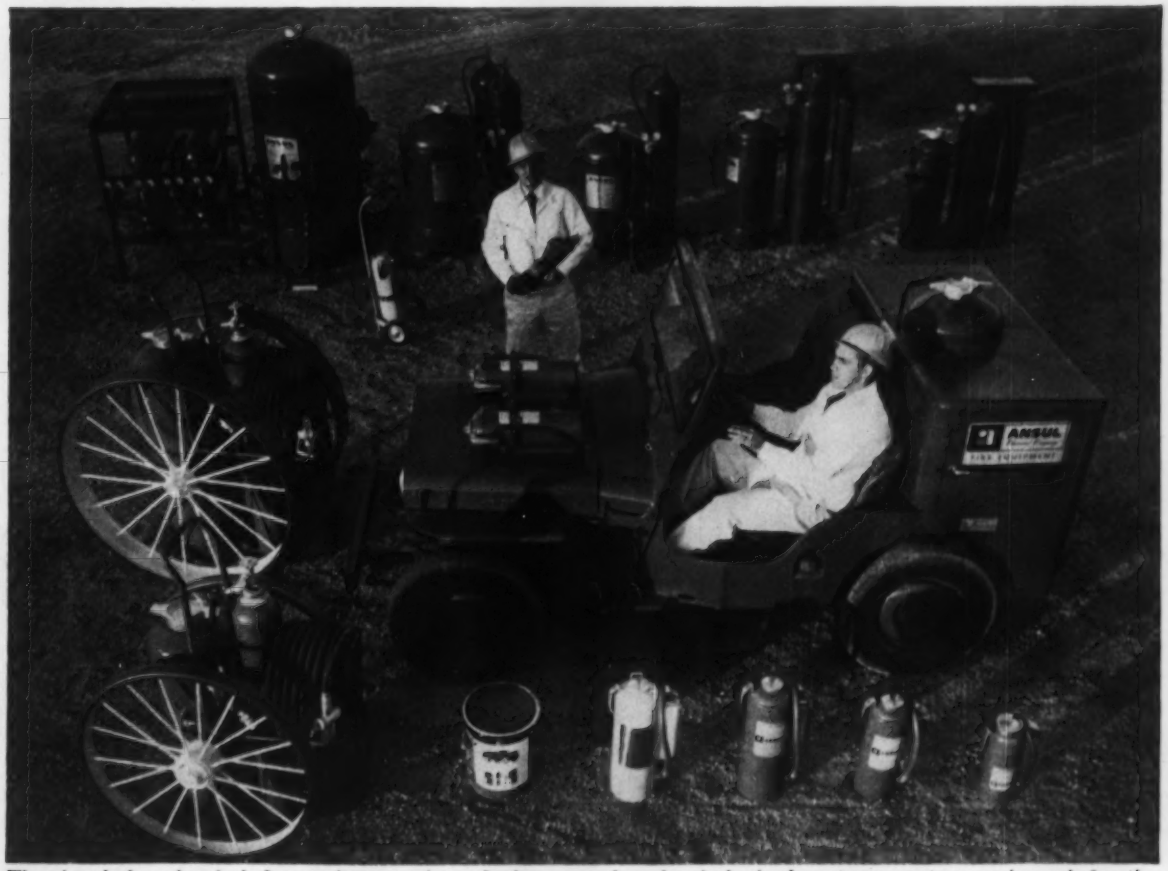
Specification Query

We have one of your Specifications Handbooks, but it does not list anything regarding workmanship, such as porosity. Can you supply a complete specification or tell us where we may obtain it?

Wm. Kratt
President
Wm. Kratt Co.
Union, N. J.

• *Our handbook gives only chemistry of materials, not physical properties. To secure the complete specification, write to Miss Margaret P. Haskin, Purchase Specifications and Standards Branch, Department of the Navy, Bureau of Ships, Washington 25, D. C.*

A revised edition of the handbook, Cross Index of Chemically Equivalent Specifications and Identification Code for Ferrous and Nonferrous Alloys *(Supply and Logistics Handbook H 1A), is available at $1.75 per copy through the Superintendent of Documents, Washington 25, D. C., or your local Department of Commerce field office.*



The Ansul dry chemical fire equipment pictured above includes portable hand units, wheeled and stationary units and a jeep installation. Ansul also manufactures automatic dry chemical piped systems, custom engineered for the hazard. Ansul equipment is listed and approved by Underwriters' and Factory Mutual Laboratories.

Only Ansul offers a Five Year Equipment Warranty

Your assurance of fast, dependable fire protection

For you, the buyer of fire equipment, Ansul's important 5 year warranty means many extra years of fast, dependable protection. It also means freedom from costly maintenance checks and repairs.

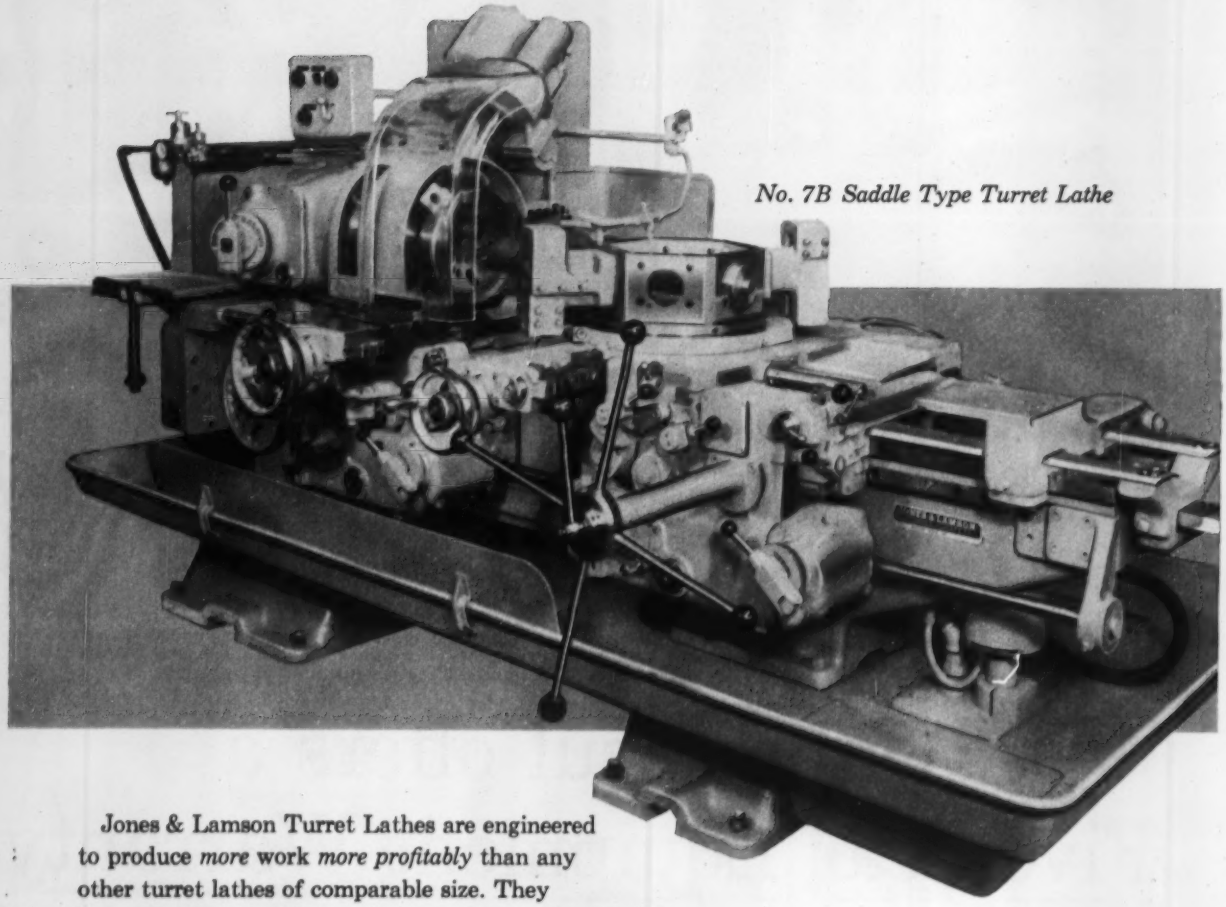
Special design and construction features make this warranty possible. Ansul's *weather-tight* construction keeps out moisture, resists corrosion. *Patented nozzles* deliver the right kind of stream for your hazard. A *sealed pressure cartridge* puts Ansul's "Plus Fifty" dry chemical to work immediately—no delay or lag. Finally, *rugged construction* makes it possible for Ansul equipment to give peak performance under the toughest operating conditions.

Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Dept. F-133, Marinette, Wisconsin. *Write Ansul for your copy of new Fire Equipment Catalog.*

ANSUL

Engineered for Precision... Powered for Production...



No. 7B Saddle Type Turret Lathe

Jones & Lamson Turret Lathes are engineered to produce *more* work *more profitably* than any other turret lathes of comparable size. They have the rugged, rigid construction that makes possible greater accuracy and the use of Hi-Velocity turning; and they incorporate many superior features that assure PRODUCTIVE CAPACITY unmatched in its class. Adequate spindle speeds and horsepower insure the proper use of carbide cutting tools at surface speeds of 650-750 feet per minute.

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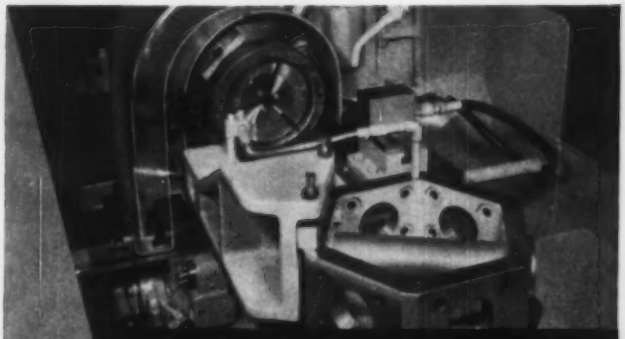
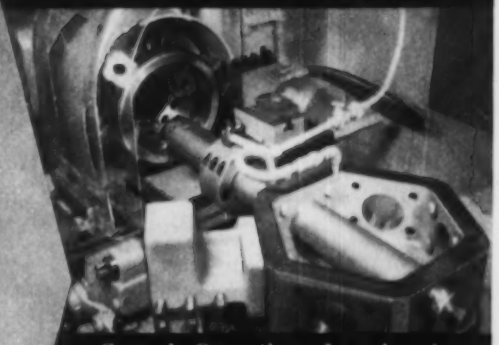
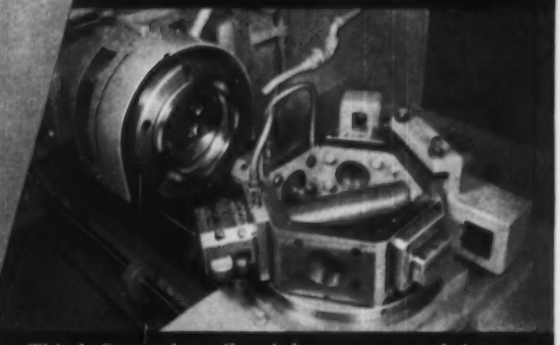
and capable of doing jobs like this...



First Operation: One tool mounted on the Hex Turret turns the O.D. while a tool mounted on the rear of the cross slide faces one end. At the end of the facing cut, the radius on the O.D. is formed.
Floor-to-floor, 1.94 min.



Second Operation: Location is taken from the two previous finished surfaces. Boring and I.D. chamfering are performed by using tools mounted on the Hex Turret while facing and forming of the O.D. are finished by tools mounted on the rear of the cross slide.
Floor-to-floor, 2.57 min.



Third Operation: Special wrap-around jaws mounted on a power operated three-jaw scroll chuck are used for holding the finish turned ring when grooving. The groove is formed by a radius tool held in a bar mounted on the Hex Turret (this applies to internal or external straight or taper races). I.D. is also chamfered in this operation.
Floor-to-floor, 1.67 min.

Machine tools do not pay dividends unless they are cutting metal. Engineering the tooling around the parts to be produced reduces the setup time to a minimum, and in many cases doubles the production per labor hour.

In this case high production methods of tooling for automatic lathes were simplified and applied to three 7B J&L Universal Saddle Type Turret Lathes. Inner and Outer Ball Bearing Races and Roller Bearing Races are produced on the same machines. Setup time from one lot to the next does not exceed fifteen to twenty minutes per machine.

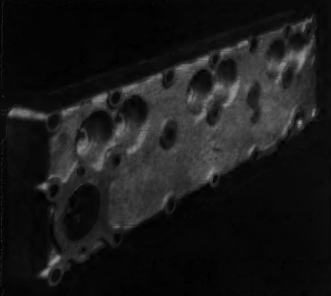
MACHINE TOOL DIVISION

UNIVERSAL TURRET LATHES • FAY AUTOMATIC LATHES • AUTOMATIC DOUBLE-END MILLING & CENTERING MACHINES • AUTOMATIC THREAD & FORM GRINDERS • OPTICAL COMPARATORS AUTOMATIC OPENING THREADING DIES & CHASERS

517 Clinton St., Dept. 710, Springfield, Vt., U.S.A.

Jones & Lamson Machine Company
517 Clinton St., Dept. 710, Springfield, Vt., U. S. A.
Please send me the J & L Machine Tool Replacement Information Kit.
*Name*_____
*Title*_____

BORES MOTOR BLOCKS 22% FASTER—
AND WITH 28% LESS TOOL WEAR



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Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron, treated with FERROCARBO, averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer grained, denser, stronger, yet they COST YOU NO MORE... because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

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for which the ALLEN-BRADLEY HANDY CATALOG PROVIDES THE BUILDING BLOCKS

Use this A-B Handy Catalog as a quick-and-easy reference guide in selecting components for trouble-free control panels.

Your special control panels may be simple or they may be complex . . . but their reliable performance can be guaranteed in advance if you use the time-tested, trouble-free components listed in the A-B Handy Catalog, shown above.

In this 120-page Handy Catalog you will find the "building blocks" for any type of control panel. Every unit has a long service record of dependable performance in all kinds of industrial applications. Being "QUALITY" products, they are a sales asset to your machines.

First—there is the simple solenoid design. With only ONE MOVING PART, there are no troublemaking pins, pivots, or bearings to corrode and stick.

Second—the double break, silver alloy contacts do away with contact maintenance. You never have to file or clean the contacts on A-B controls.

Third—the Quality workmanship that goes into A-B controls is obvious at a glance. Use A-B "building blocks" for your special panels or let A-B build such panels for you!

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SOLENOID MOTOR CONTROL

8-55-R

The Quality Line
of Manual Motor Starters

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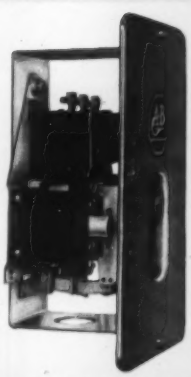
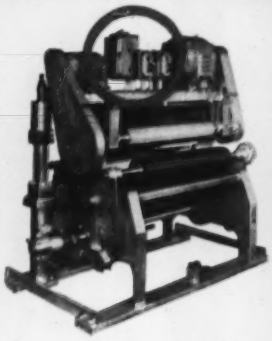
WATERTIGHT

EXPLOSION-PROOF

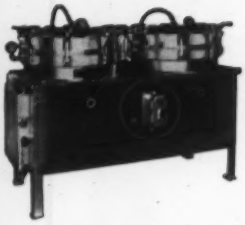


FLUSH TYPE

A-B manual starter, in NEMA 1 general purpose enclosure, on DeWalt metal cutter.



A-B manual starters, in NEMA 4 watertight enclosures, on Stehling fleshing machine.



A-B manual starter, in NEMA 7 explosion-proof enclosure, on Hilco oil reclaimer.

A-B manual starter, in Type 1B1 flush mounting, on Noble & Westbrook shell marker.

The popularity of Bulletin 609 manual starters rests on the following facts!

1—They are so simple. Few moving parts mean few chances for trouble.

2—Quick-make and quick-break switching action prevents contact "teasing."

3—Double-break, silver alloy contacts need no cleaning or filing—they are always in perfect operating condition.

4—Use of "buttons" for ON and OFF switching is in line with operation of automatic starters and is convenient for machine operator.

5—The two solder-pot overload breakers provide continuously dependable and accurate motor overload protection.

Be sure to send for a bulletin describing the full line of A-B Bulletin 609 manual across-the-line starters up to 5 hp, 220 v; 7½ hp, 440-550 v.

Bulletin 646 autotransformer starter.

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SOLENOID STARTERS

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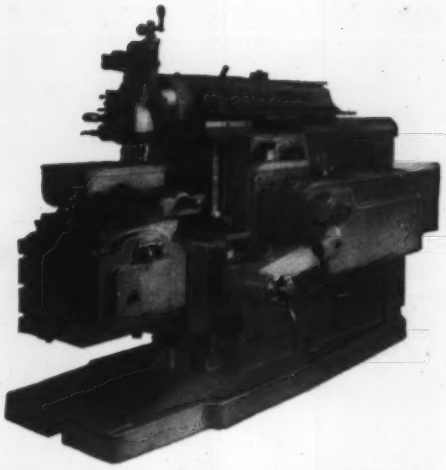

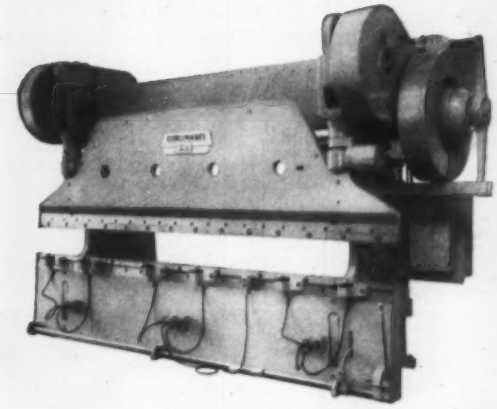

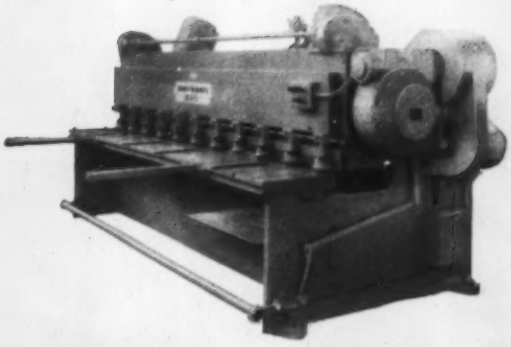

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5 Year Guarantee

on material and workmanship on all new machines shipped after September 1, 1955. This guarantee is evidence of the unusual dependability of our machines.

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CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

BEE'S IDEA of good housekeeping—frames for honeycomb boxes are neatly spaced with CF&I-Wickwire Tinned Finish Bee Wire.

CF&I—WICKWIRE MAKES WIRE FOR THOUSANDS OF USES

VERTICAL TRAFFIC in buildings moves up and down safely and smoothly on elevator cables made of CF&I-Wickwire Rope Wire.

to support everything from a honeycomb to a freight elevator . . . count on wire

An amazing number of widely varying needs for wire is encountered every day. The reason wire can be used so many different ways and for so many different purposes is because properties to suit almost any set of specifications can be built into the wire itself. Whatever your wire requirements—from rope wire of tremendous strength to easily-bent floral wire—your needs can be answered to your complete satisfaction. And CF&I-WICKWIRE, offering over a century of experience and complete wire-drawing and forming facilities, can provide exactly the wire you need.

You'll like doing business with CF&I-WICKWIRE and the particular attention given your own specific requirements. And you'll like the prompt service you get from CF&I-Wickwire Plants conveniently located from coast to coast. For detailed information, write our nearest district sales office.

"KEEP OUT" signs for insects. Screen cloth woven from CF&I-Wickwire Weaving Wire provides lasting protection against all kinds of flying insects.

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WIRE SKELETON for new roads gives them greater strength and longer life. Here welded wire fabric is being laid down. Fabric is made of CF&I-Wickwire Industrial Quality Basic Wire.

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CF&I

3146

(Advertisement)

New High-Torque Unbrako self-locking socket set screws

set them, forget them—they stay tight

Up to 40% higher tightening torque—a new Unbrako feature

RECOMMENDED SOCKET SET SCREW TIGHTENING TORQUES (Inch-Pounds)

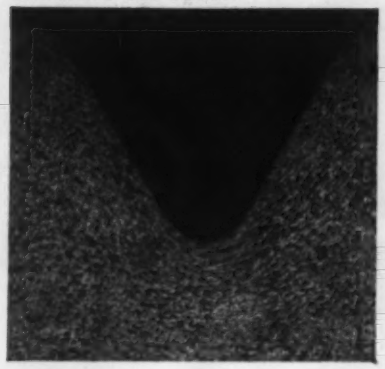
SCREW SIZE	UNBRAKO	SET SCREW B	SET SCREW C	MINIMUM DIFFERENTIAL %
#4	5	3.9	3.5	28
#5	9	7.8	7.4	15
#6	9	7.8	7.4	15
#8	20	14.7	14.5	36
#10	33	26.5	25	25
1/4	87	62	60	40
5/16	165	122	125	32
3/8	290	198	225	29
7/16	430	309	350	23
1/2	620	460	500	24
5/8	1225	1106	1060	11
3/4	2125	1540	1800	18
7/8	5000	3660	4600	9
1	7000	5025	6500	8

All UNBRAKOS can withstand higher tightening torques than ordinary set screws. For example, the recommended torque for a ¼" UNBRAKO is 87 inch-pounds —40% greater than that recommended for an ordinary set screw.

Research has proved that the tighter you seat a set screw the better it works. We went to work to design a socket set screw that could be tightened tighter than ever before without damaging the screw.

We formed a deeper socket. We put a radius in the socket corners. We developed fully formed threads. We established new methods of heat treatment in atmosphere-controlled furnaces. It took almost 6 years' research and development, but the new High-Torque UNBRAKO incorporates all of these improvements. And it retains the self-locking knurled cup point that keeps an UNBRAKO tight up to 48 times as long as a plain cup point set screw, regardless of the size of the point or the cup.

UNBRAKO SET SCREW

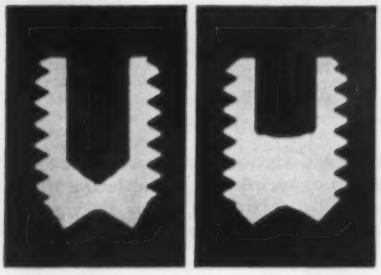


We fully form the threads—make the whole screw stronger. The metal is compressed into the closely knit grain structure that you see in this illustration. The grain flow follows the contour of the threads. There are no straight lines along which shear can occur. The UNBRAKO retains its flow lines even when ground down to .010" below root diameter. Screws with cut or ground threads lose thread form at root diameter.

UNBRAKO SET SCREW

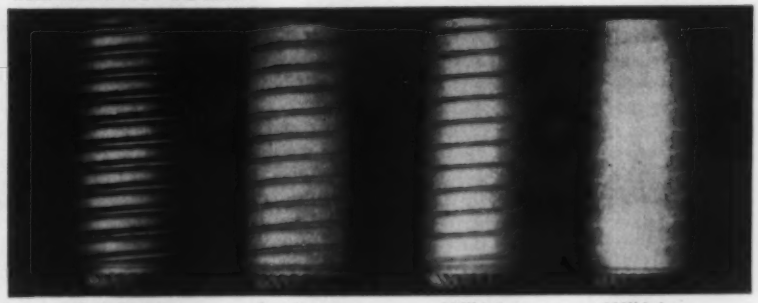
We put a radius in the socket corners—eliminate the sharp corners where cracks start. This distributes the stresses developed when tightening torques are applied. Ordinary socket screws have sharp corners which often crack when tightened even at lower recommended torques.

UNBRAKO SET SCREW **ORDINARY SET SCREW**

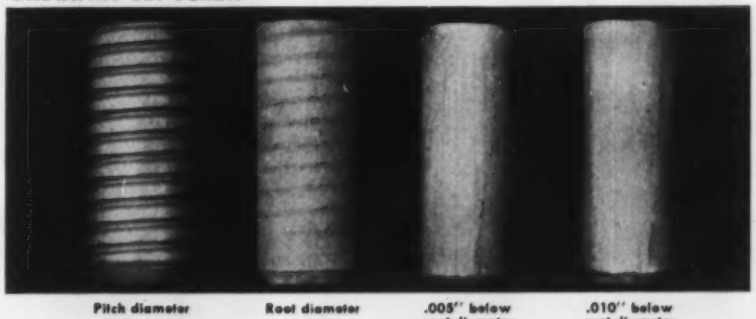


We form a deeper socket—give you more purchase with the wrench. Since more wrench can be put into the UNBRAKO socket, you can set the screw much tighter. And you won't ream the socket or round the corners of the wrench.

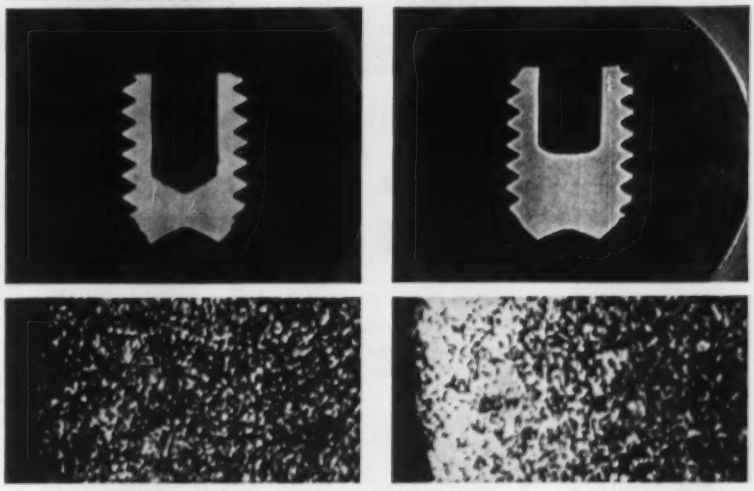
UNBRAKO SET SCREW



ORDINARY SET SCREW



UNBRAKO SET SCREW **ORDINARY SET SCREW**



We heat treat an UNBRAKO properly. It's a ticklish job to heat treat a socket set screw. If you don't do it just right, you get decarburization. And decarb plays havoc with a screw. Put a wrench in the socket and you ream it. Run the screw into a tapped hole and you strip its threads. Try to seat the screw and its point shears off. These photos show the good and the bad. The UNBRAKO is clean. Its grain structure is uniform. There is no decarburization—the ordinary screw is suffering from an overdose of it, socket walls, threads and point are full of the telltale white spots.

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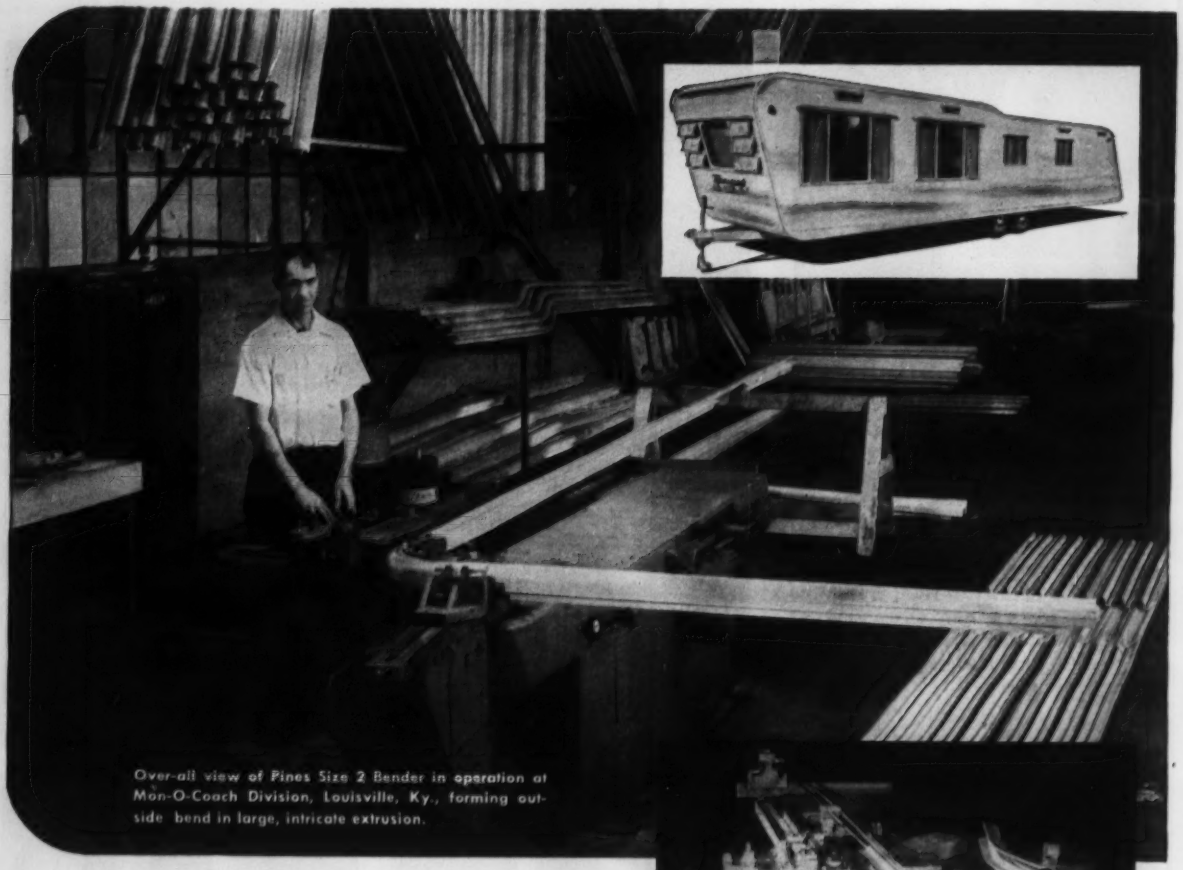
UNBRAKO® SOCKET SCREW DIVISION SPS JENKINTOWN, PENNSYLVANIA



Over-all view of Pines Size 2 Bender in operation at Mon-O-Coach Division, Louisville, Ky., forming outside bend in large, intricate extrusion.

PRODUCTION BENDING ALUMINUM EXTRUSIONS THE "PINES-WAY"

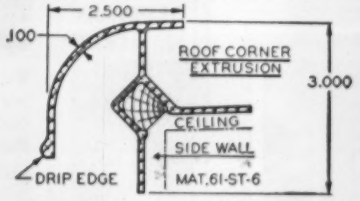
The new, luxurious Mon-O-Coach Mobile Home, manufactured by Mon-O-Coach Division, Ironwood Trailer Coaches, Inc., Louisville, Ky., is a marvel in modern metals engineering. It features all-aluminum structural members which are now cold formed and shaped accurately by production bending methods. Previously, many of the bends were formed by slitting and hand-bending a section, then re-joining the slotted section by welding. Today, a Pines Size 2 Production Bender handles these jobs fast and efficiently.

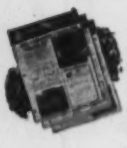
Slitting and Welding Operations Eliminated

All curved sections are now cold formed in a single operation, including an offset bend in an opposite plane in one of the most ingenious extrusions probably ever developed for the automotive industry. Shown in drawing, this large unique extrusion, incorporating a 5/8" wood section, is a top corner section which serves as a means of fastening top, sides, and front panel members together. Tooling by Pines forms neat, smooth bends without excessive distortion or wrinkling, completing the piece with the wood section in place. Previous slitting and welding operations are eliminated.

▲ View of tooling for making offset bend in opposite direction. Two plug-type mandrels support inner walls. Smooth, neat bends are formed at a bending arm speed of 6.0 r.p.m.

▼ Cross-section of Mon-O-Coach's intricate, top corner extrusion. Hollow center incorporates 5/8" wood section installed before bending—serves as a means for fastening wall studdings.





Write FOR MORE DATA

If you would like more data on production bending of aluminum extrusions the "Pines-Way", write for free copies of "Pines News". Or ask for a Pines engineer to call and assist you with any production problem.

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Specialists in Tube Fabricating Machinery · 662 WALNUT · AURORA, ILLINOIS

PRODUCTION BENDING · DEBURRING · CHAMFERING MACHINERY

CALENDAR
OF MEETINGS

Oct. 3-5, National Electronics Conference Inc.: Annual meeting and exhibit, Sherman hotel, Chicago. Conference's address: 84 E. Randolph St., Chicago 1, Ill. Executive secretary: John S. Powers.

Oct. 3-7, American Institute of Electrical Engineers: Fall general meeting, Hotel Morrison, Chicago. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Oct. 6-7, National Foundry Association: Annual meeting, Edgewater Beach hotel, Chicago. Association's address: 53 W. Jackson Blvd., Chicago, Ill. Secretary: Charles T. Sheehan.

Oct. 6-8, Society of Industrial Designers: Annual meeting, Woodner hotel, Washington. Society's address: 48 E. 49th St., New York 17, N. Y. Secretary: Sally G. Swing.

Oct. 7-8, American Ceramic Society Inc.: Refractories division meeting, Bedford Springs hotel, Bedford, Pa. Society's address: 4055 N. High St., Columbus 2, O. General secretary: Charles S. Pearce.

Oct. 9-12, Pressed Metal Institute: Fall meeting, Grove Park Inn, Asheville, N. C. Institute's address: 3673 Lee Rd., Cleveland 20, O. Managing director: Harold A. Daschner.

Oct. 9-13, Electrochemical Society Inc.: Fall meeting, Hotel Statler, Pittsburgh. Society's address: 216 W. 102nd St., New York 25, N. Y. Secretary: Dr. Henry B. Linford.

Oct. 10-12, American Mining Congress: 1955 metal and nonmetallic mining convention, Las Vegas, Nev. Congress' address: 1102 Ring Bldg., Washington, D. C. Executive vice president: Julian D. Conover.

Oct. 10-12, American Society of Lubrication Engineers and American Society of Mechanical Engineers: Joint lubrication conference, Antlers hotel, Indianapolis. Information: American Society of Lubrication Engineers, 84 E. Randolph St., Chicago 1, Ill. Secretary: William P. Youngclaus Jr.

Oct. 10-12, Truck Body & Equipment Association Inc.: Annual convention and exhibit, Morrison hotel, Chicago. Association's address: 1616 K St. N.W., Washington 6, D. C. Executive manager: Arthur H. Nuesse.

Oct. 11-15, Society of Automotive Engineers Inc.: Aeronautic meeting, aircraft production forum and engineering display, Hotel Statler, Los Angeles. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Oct. 12-14, Gas Appliance Manufacturers Association: Annual meeting, El Mirador hotel, Palm Springs, Calif. Association's address: 60 E. 42nd St., New York 17, N. Y. Secretary: H. Leigh Whitelaw.

Oct. 13-15, Foundry Equipment Manufacturers Association Inc.: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Association's address: One Thomas Circle, Washington 5, D. C. Secretary: C. R. Heller.

Oct. 14-16, Metal Treating Institute: Annual meeting, Warwick hotel, Philadelphia. Institute's address: 271 North Ave., New Rochelle, N. Y. Secretary: C. E. Herington.

Oct. 16-18, Conveyor Equipment Manufacturers Association: Annual meeting, the Greenbrier, White Sulphur Srings, W. Va. Association's address: One Thomas Circle, Washington 5, D. C. Executive vice president: R. C. Sollenberger.

Oct. 17-18, American Coke & Coal Chemicals Institute: Annual meeting, the Greenbrier, White Sulphur Springs, W. Va. Institute's address: 711 14th St. N.W., Washington 5 D. C. President: Samuel Weiss.

Oct. 17-18, Boston Conference on Distribution: Hotel Statler, Boston. Information: Daniel Bloomfield, director, 80 Federal St., Boston 10, Mass.

Oct. 17-19, American Management Association: Office management conference, Hotel Statler, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president: James O. Rice.

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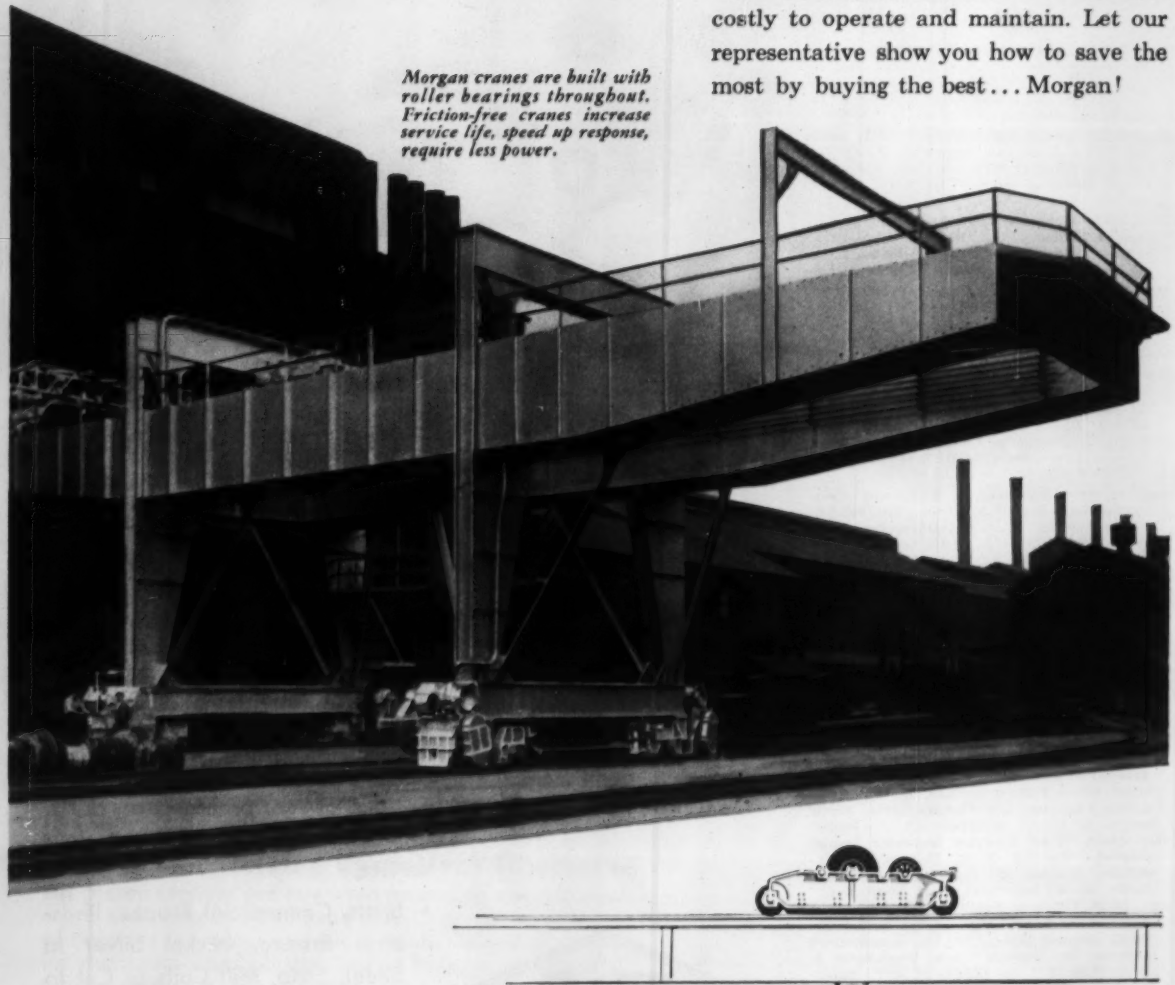
Morgan cranes are built with roller bearings throughout. Friction-free cranes increase service life, speed up response, require less power.



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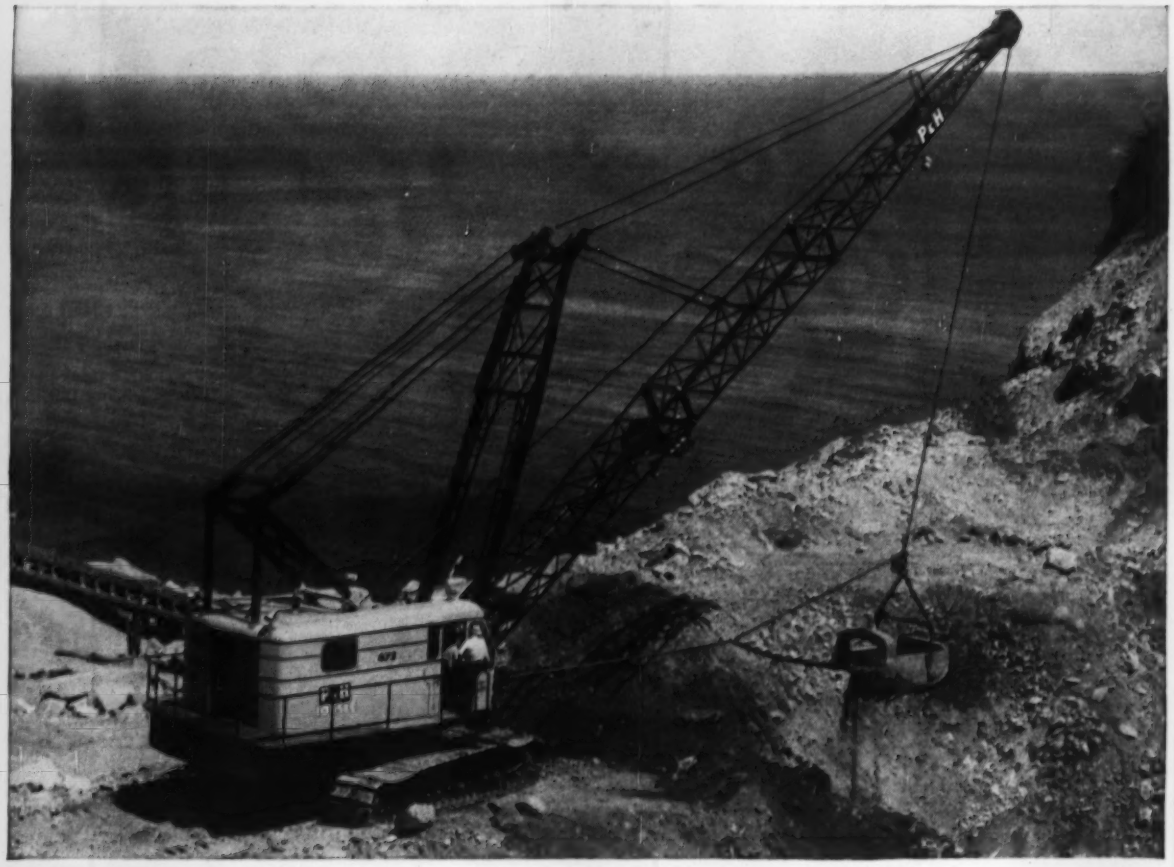

GRAVER Fabricates All-Welded Revolving Frames for P&H Power Shovels

The versatile P&H Dragline pictured above, feeding rock onto a conveyor (Model 1055 LC) uses an all-welded revolving frame for extra strength. Graver recently fabricated five such assemblies for the Harnischfeger Corporation, one of which is shown in the inset.

This is an integrally welded rigid unit of box section design to withstand the great variety of stresses it will encounter. Traditional Graver quality is seen in the uniform welds which were inspected during manufacture by the most modern and comprehensive techniques. These include the initial accurate dimensional inspection on specially designed layout tables, periodic visual inspections, and magnetic particle and X-ray inspections.

Graver has achieved a reputation for developing new equipment and advanced techniques and is expert in welding carbon and stainless steels, and aluminum. For the more complex, difficult welding problems consult your Graver engineering representative. Meanwhile write for new illustrated brochure, "WELDMENTS."

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GRAVER ... *source for quality weldments*

Here's where you get the answers to steel problems

● Look under "The Youngstown Sheet and Tube Company" in one of these alphabetical or classified phone books.

They represent the 28 conveniently located district sales offices Youngstown maintains across the country. Offices staffed by men who know the steel business. Men who know and understand **your** steel problems. Men who are qualified to help you get the specific steel you need.

When you want answers to steel problems in a hurry, just call the Youngstown office nearest to you.

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THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

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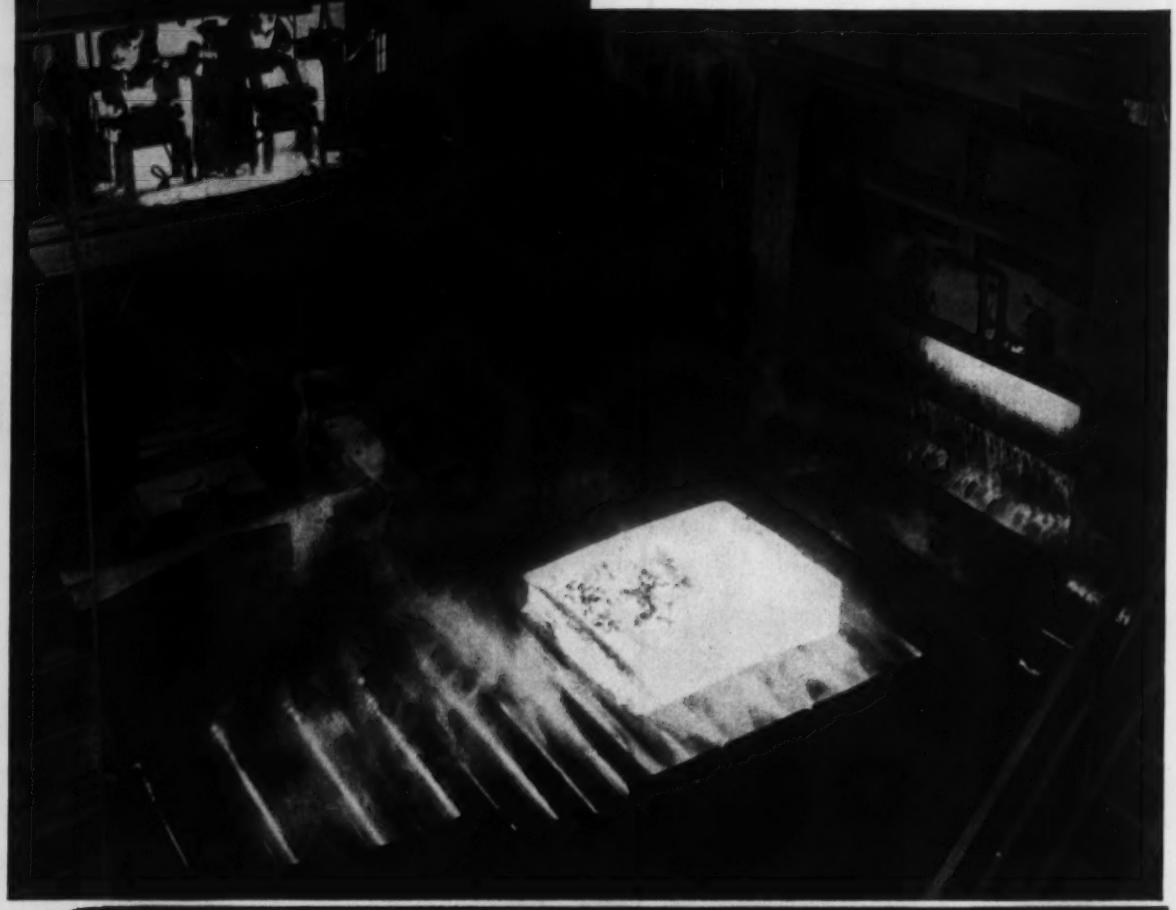
Cold facts about hot steel

IT'S a fact—just a fraction of a cent saved per pound adds up to considerable extra profit on every ton of steel you roll. And there's only one way to get these savings—make sure all your machinery and equipment runs at maximum efficiency, minimum upkeep cost. Let Texaco help you.

For example, use *Texaco Meropa Lubricant* on enclosed reduction gears and their bearings. Its high EP stability and resistance to oxidation mean smoother operation, longer gear and bearing life.

A Texaco Lubrication Engineer can help keep you rolling toward greater profits while keeping your maintenance costs low. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



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TUNE IN . . . TEXACO STAR THEATER starring JIMMY DURANTE on television . . . Saturday nights, NBC.

Metalworking Outlook

Nickel Diversion

Look for ODM Director Arthur Flemming to order diversion of 2.5 million lb of nickel from the stockpile in both November and December. That amount has just been diverted for October, bringing the total since February to 15.75 million lb. Somewhat less aluminum will be available to fabricators in the fourth quarter, partly because about 100 million lb of the light metal will have to be delivered to the stockpile before the end of December. An estimated 788 million lb of primary aluminum was turned out in the third quarter; some 767 million lb will be this period.

Music for 1956

CIO economists join their voices to the chorus currently singing praises of 1956's economic prospects. Admitting that they were surprised at the size of 1955's upturn, they foresee sustained high notes for 1956. Why was the boom bigger than expected? "The upward surge of consumer spending and consumer-related activities, backed by rising consumer credit and mortgage debt" account almost entirely for the rise, they say.

Jobs, Jobs, Jobs

U.S. employment will continue to grow by 1,250,000 additional jobs annually for the next 15 years, despite automation. So predicts General Electric Co.'s Dr. W. R. G. Baker, who says that nearly 1000 plants will spend from $250,000 to $500,000 each in 1955 on facilities of a supermechanical nature, controlled by electronic processes.

Venezuela To Get Steel Plant

Fiat Motor Car Co., Turin, Italy, submitted a low bid of $128 million to build a steel plant for Venezuela. Fiat won out over bids of groups from six other countries, including the U.S. Construction will begin immediately, and production is planned for early 1958. The eventual capacity will be 421,000 tons yearly at a site near Puerto Ordaz at the junction of the Orinoco and Caroni rivers. Facilities will include three Siemens-Martin furnaces of 175 tons capacity each, a reversible blooming mill, two rolling mills for light structural sections and rails and three combined mills to roll reinforcement bars and wire rods. Venezuela is using 600,000 tons of steel a year, 14 times the 43,000 tons used in 1943. Per capita consumption exceeds 220 lb a year, highest in Latin America.

Hassle on Exports

Study carefully the list of some 900 products on which the State department may offer tariff cuts at the next general session of GATT. The General Agreement on Tariffs & Trade will convene in Geneva, Switzerland, next January. You can get the list from the State department whose Committee for Reciprocity Information will hold hearings starting Oct. 31. If you want to be heard by the group, make your application by Oct. 17. Also starting Oct. 31, the Tariff Commission will hold hearings on the

extent to which U.S. concessions on the listed products may be made without injuring domestic industry.

New Rules from the Pentagon

Watch for changes in Defense department buying. They'll come as a result of new rules laid down by Assistant Secretary Thomas P. Pike governing placement of contracts for $10,000 or more for 1000 strategic and critical items on the Preferential Planning List. New instructions are designed to implement a controversial directive issued last December by Secretary Charles E. Wilson. It said that price was not to be the only consideration in awarding contracts. The instructions list nine factors to be considered in making awards.

Small Business Gains

The July share of defense contracts awarded to small business increased 24 per cent from a year earlier. For the first seven months of 1955, small business received 23.3 per cent of the total contract awards, compared with an average of 18.5 per cent over the last 4½-years.

Boom in Basic Metals

Both the power and transportation aspects of the St. Lawrence development promise to boom the basic metals industries in New York state. Examples: Aluminum Co. of America will spend some $26.7 million on new primary capacity at Massena by 1958 (see page 41); Republic Steel Corp. is considering more development of its Port Henry district mines and of its leases near Santa Clara and Ft. Ann; Jones & Laughlin Steel Corp. plans more beneficiation of New York ores at a plant south of Massena; American Steel & Wire Division of U.S. Steel Corp. is showing new interest in ore properties in Clinton county; National Lead Co. is considering locating a titanium smelter in the central Adirondacks. Sidelight: Ten Canadian companies are sniffing about for New York state locations of branch plants.

Danger, Fire

First-half fire losses totaled $470 million, up 3 per cent from the same 1954 period. Much of that loss is from industrial damage. A survey by one insurance company shows that the average amount recoverable on fire losses is only 52 cents on the dollar because of inadequate coverage. Reviewed your coverage lately?

Straws in the Wind

Anaconda Co. discloses plans to make alumina from clays found in the Northwest . . . Dravo Corp., Pittsburgh, will begin commercial manufacture of prefabricated heliports, landing areas for helicopters . . . The Air Force is studying the possible need for a big increase in the air arm as a result of Soviet gains.

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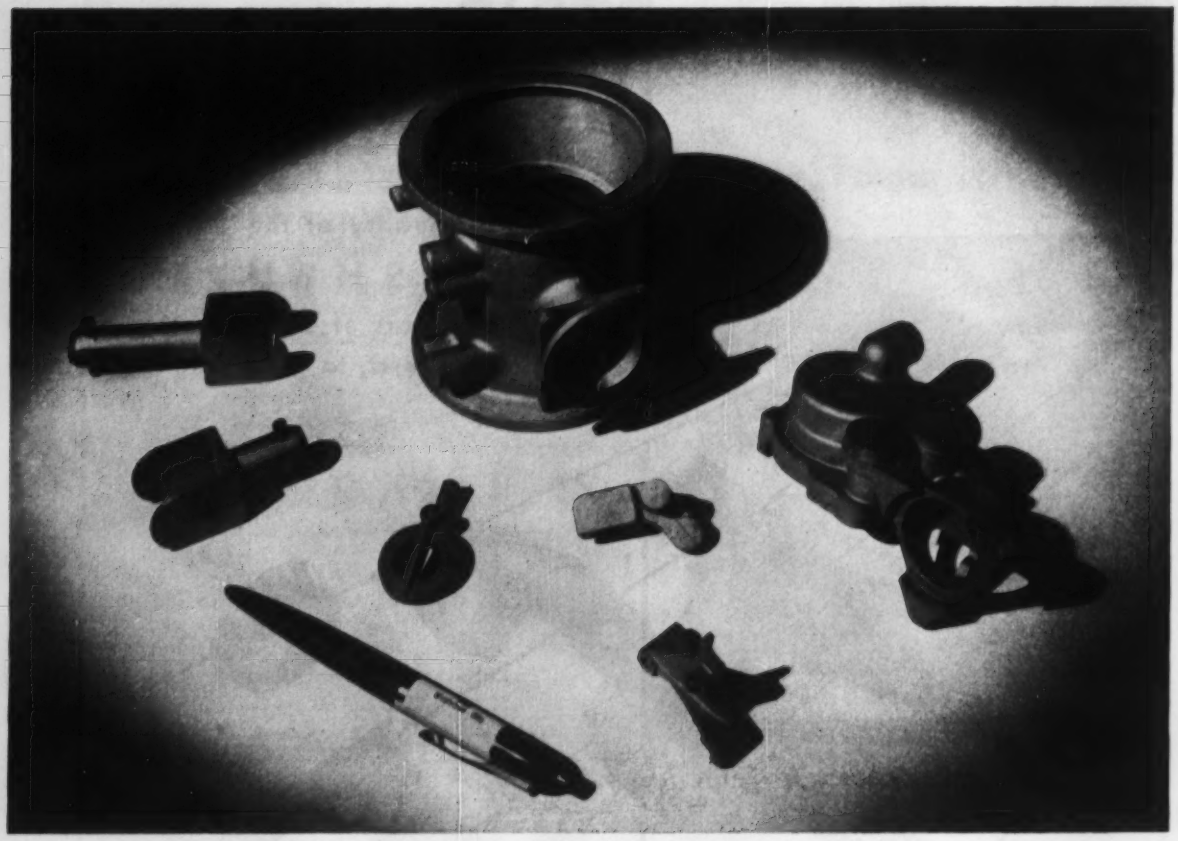

Stainless castings show up to 190,000 psi strength after 875 F hardening treatment

Foundries report ultimate tensile strength as high as 190,000 psi in investment castings of Armco 17-4 PH Stainless Steel. This precipitation-hardening grade is easy to cast. It fills thin sections and details nicely, surface finish is good and tolerances small.

READILY MACHINABLE Armco 17-4 PH investment castings machine readily to an excellent surface finish. The subsequent 1-hour hardening treatment at 875 degrees F will not distort the part nor damage the surface. It causes only a slight discoloration.

NUMEROUS SUPPLIERS Armco does not make castings. If you are interested in high-strength, low-temperature hardening castings with high corrosion resistance, just fill out the coupon. We'll send you a list of suppliers of investment castings and other types made of Armco 17-4 PH Stainless Steel.

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A Grim Reminder

President Eisenhower's heart attack brings home to every American the grave implications of his possible loss to the nation.

To those charged with the destiny of a business organization, the President's illness is a grim reminder of the responsibility they owe the men to whom they have delegated authority.

A business enterprise is usually thought of as money, plant, equipment, processes, materials, markets and men. Increasing recognition is being given to men as the most important element.

Energetic and capable people are needed to serve as the motivating force in carrying out the interrelated functions of a business. Without them the other elements are meaningless.

The implications are clear: Because the pressures of office are inevitable, the general well being of the individual, as well as his health, must be considered.

Top management has the responsibility to select and place people in positions for which they are best suited and from which they will derive full satisfaction. It means keeping people happy and busy in their jobs but not overloading them with assignments beyond their physical and mental capabilities.

It's part of the development of a healthier organization with the zest and enthusiasm to get the best job done. But practicing good human relations is not the complete answer.

More and more companies are going to health programs to safeguard their management personnel and uncover unsuspected and potentially serious illnesses. Some plans are obligatory; others are voluntary. Some cover only top executives; others go down as far as the foremen.

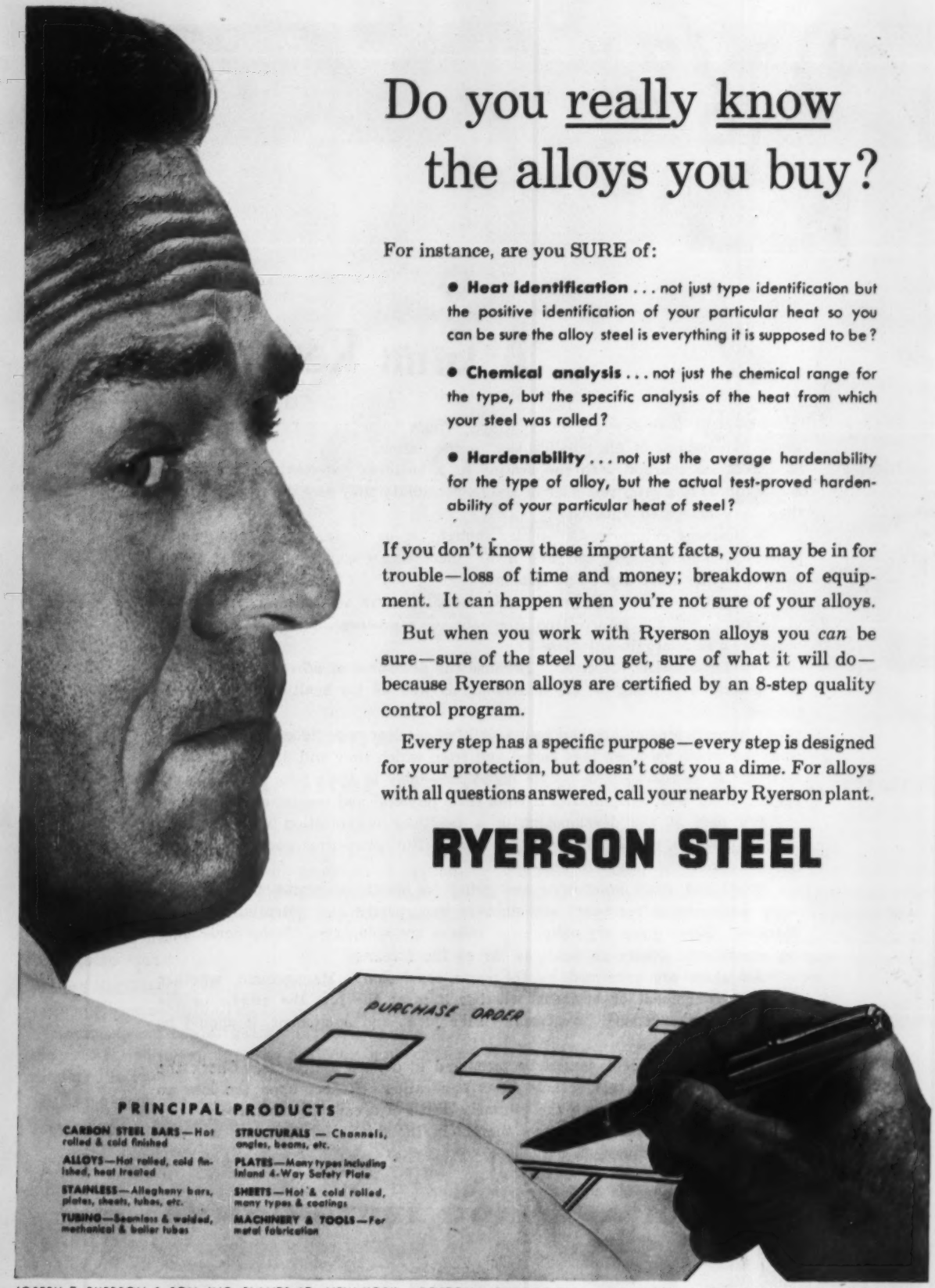
All plans are prompted by the same conclusion: Management, whether it is in government or business, whether it is at the top, the middle or the bottom, is an expensive investment. Like plant and equipment, it should be protected.

But the investment cannot be measured in dollars and cents. Check the obituary columns in this or any other publication. Reflect upon the loss an organization suffers through the untimely death of a capable executive.

The grim reminder is always there. In the final analysis, men, not machines, make a business.

Irwin H. Such

EDITOR



Do you really know the alloys you buy?

For instance, are you SURE of:

- **Heat identification** . . . not just type identification but the positive identification of your particular heat so you can be sure the alloy steel is everything it is supposed to be?
- **Chemical analysis** . . . not just the chemical range for the type, but the specific analysis of the heat from which your steel was rolled?
- **Hardenability** . . . not just the average hardenability for the type of alloy, but the actual test-proved hardenability of your particular heat of steel?

If you don't know these important facts, you may be in for trouble—loss of time and money; breakdown of equipment. It can happen when you're not sure of your alloys.

But when you work with Ryerson alloys you *can* be sure—sure of the steel you get, sure of what it will do—because Ryerson alloys are certified by an 8-step quality control program.

Every step has a specific purpose—every step is designed for your protection, but doesn't cost you a dime. For alloys with all questions answered, call your nearby Ryerson plant.

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PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished

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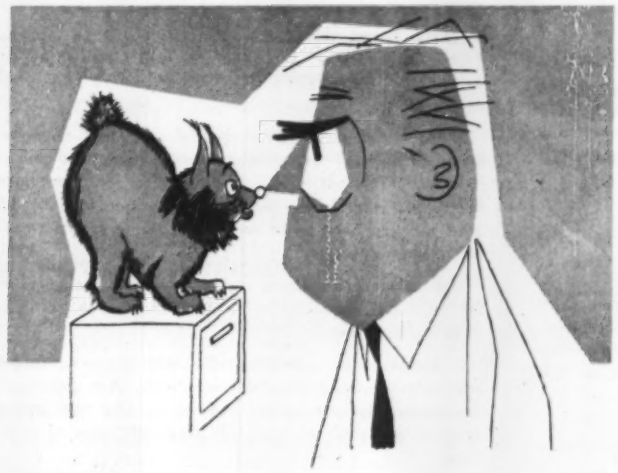


With unauthorized strikes rising, industry wants to know . . .

How To Tame Wildcats

IT'S MIGHTY tough for many companies to lick the weight of wildcats.

One steel company has suffered 135 unauthorized walkouts in the last 20 months. An auto firm lost more than 100 hours per employee during the last year due to work stoppages in defiance of authority. Many firms report the cost of unsanctioned strikes far exceeds the price of union contract demands.

The Cost—Every 20 seconds of lost production at some auto plants means a car isn't produced. At the same time, costs continue to mount. One source estimates a bad year of wildcats can easily cost larger firms over $1 million, often more.

The problem isn't peculiar to the larger companies. Unpredictable halts in production cost a foundry supplying the auto industry top contracts for failure to meet delivery dates. A history of wildcats soon gets around among purchasing agents who have been clawed by parts shortages. Many would-be suppliers don't get considered when bids are on the table.

The Results—Conversely, a wildcat strike in a prime contractor's plant cuts suppliers' orders back accordingly. Because most suppliers' profits are carefully balanced on an uninterrupted volume, a wildcat in a customer's plant may lick the gravy off the job or even break the back of the small supplier. While losses to the smaller firm may not be so spectacular, often they are more lethal.

Getting statistics on losses due to wildcat strikes in metalworking is difficult, in part due to the nature of the wildcats themselves. Ten men decide it's too hot in a grinding department and request a fan. Five minutes of production are lost until the fan arrives. Or a trim crew on an auto assembly line finds only five men are on the job instead of the usual six and stop work for 10 minutes until a substitute can be pulled on the job. Or they can slow down to five-sixths of the normal output, and the wildcat becomes a slowdown instead of a stoppage.

Language — Perhaps the only complete definition of a wildcat is: An interruption of normal production in defiance of authority.

Ambiguous — "Defiance of authority" covers a multitude of sins. One authority in a true wildcat must be the recognized bargaining agent. Not only must the workers defy orders of the shop supervisors to return to work, but under the no-strike clauses of most union contracts, union representatives also must order them to return to work. But it's no secret to most management men that many strikes which dwell in the sanctity of the wildcat are planned.

That's because the union can be fined for any walkout it sanctions which breaks the no-strike clause in the contract. Determining whether such a strike is a true "wildcat" plays hob with the statistics.

One labor relations expert candidly observes that there are probably few spur-of-the-moment strikes. Most strikes, he feels, are planned and result of a compounding of gripes and grievances.

Guardians — Supervisors trained to detect sagging morale in their departments frequently can bring the matter to management's attention in time to prevent trouble. Employees want their complaints listened to and acted on, and even the normal channel of the grievance procedure may be considered too slow unless the employees are constantly reminded that management is aware of the problem.

Because sagging morale is a hallmark of wildcats a large school believes that better employee communications are the key to preventing wildcat stoppages. They point out that labor must be made aware of the problems of management and must be made to know that management is aware of the problems of labor. The recent visit of David McDonald, United Steelworkers' president, to Great Lakes Steel Corp. exemplifies this point of view.

Case in Point — Said Mr. McDonald in referring to 60 stoppages between June 30, 1954, and Aug. 31, 1955: "There has been difficulty here at Great Lakes Steel, difficulties which I believe have arisen out of a lack of knowing one another intimately, and a lack of proper communications between one another . . . I would like to see a situation develop here where it will not be necessary for men of either the union or management to resort to actions which are outside the regular operation

Wildcats—The Nature of the Beast

Who starts wildcats?

Most wildcats are planned work stoppages instigated by a few individuals attempting to demonstrate their strength or leadership. New union committeemen and deposed union representatives in the plant are the chief potential source of wildcat leadership.

What causes wildcats?

Almost invariably, union politics. Reasons cited (like not enough men on the crew, excess heat, improper discipline) may be considered the reason by the majority of workers who walk out. This is just the excuse the leaders have given them.

Why does the majority follow?

In part because it believes the gripe is the real reason for the strike. But, more importantly, the majority is not active in the union. These people want to avoid trouble and walk out for fear of reprisal, even though the strike will cost them money.

Can wildcats be anticipated?

By sensitive supervisors, yes. Watch for an unusual number of grievances from some department; conditions are getting bad or someone is trying to stir up the workers. New union committeemen, too, are a signal for close attention to the department involved.

How to tame wildcats

The three basic areas for work to halt wildcat stoppages are:

1. Employee communications—Be sure the employees know the reasons why your company pursues the policies it does. Use your plant publication to let them know the reasons for changes and be sure people in a department are kept advised of such small things as the reason for moving a machine.

Stop misunderstandings, and you make it tougher for the would-be union leader to find excuses for a strike to give the workers.

2. Attention to grievances—Be sure your employees' grievances are handled quickly and fairly. Let them know the reason for any delay, and insure that the umpire does an impartial job that will avoid any taint of favoritism.

Quick, understandable justice through the regular grievance procedure makes strikes harder to justify to the majority by the militant few.

3. Firm and certain discipline—Be sure your employees know the penalty for leaving their work without authorization and that it will be enforced. Let your employees know that you expect them to observe the plant rules and the contract. Never agree to waive your right to discipline in exchange for getting the workers back on the job.

If you have a wildcat

The techniques described above will help to prevent a wildcat by reducing the willingness of the majority to

of the labor agreement to rectify differences of opinion . . .

"We want grievances settled even before they become grievances. We would like to see them all settled in the complaint stage."

Toward that end Mr. McDonald suggested that a committee of union and management officials meet once a month. This meeting would not be a grievance meeting, but rather one "which will enable the company to explain to the union why it is pursuing certain policies and for the union to explain to the company why it, too, is pursuing certain policies."

Steps — Paul Carnahan, president of the National Steel Corp. subsidiary, then pointed out that management at the plant had undergone a program of education on the labor contract to minimize the troubles that arise from mistakes and misunderstandings. A new program is being initiated on how to get along with people, a move to smooth the supervisor-employee relationship still further. "We want our management to be fair, to be friendly and considerate of others in all respects," said Mr. Carnahan.

He endorsed Mr. McDonald's suggestion of a union-management committee and pointed out to workers that when an illegal work stoppage occurs, it does a great injustice to others who are thrown out of employment and to the company. "It also damages collective bargaining generally, because the object of the contract is to eliminate such occurrences," observed Mr. Carnahan.

Hard-bitten Great Lakes Steel workers, interviewed after the meeting, said: "It sounds good, but we'll wait and see."

Pointers—You won't find many who will argue with these steps at Great Lakes to tame the wildcat: Management is trained to know the contract and to interpret it uniformly; management is being trained to handle workers with tact and sympathy; through the labor-management committee management and union will have increased insight into why policies for better understanding are being pursued; and the union and company president have expressed respect for the contract and a desire for fair play.

But there are those who argue that however fine communications are, one thing is better—discipline.

Counterpart — One spokesman for a metalworking firm likens the labor-management interplay to the international situation: "The Russians listen to our UN delegates and communicate with our diplomats, but they stay put because of our Armed Forces."

listen to agitators. When a wildcat occurs, it should be handled as any law violation or breach of faith, fairly but firmly.

Remember that you can be subject to charges of unfair labor practice. Workers must not have a legitimate reason for leaving, such as illness, dangerous working conditions, etc. For that reason, your front-line supervisor becomes vital in obtaining data that will justify your action.

Instructions to supervisors

Promptly report any rumors of a strike or stoppage to higher supervision and the labor relations department.

When a strike or stoppage occurs:

1. Notify higher supervision and the labor relations department. Phone if possible; otherwise, use a messenger.

2. Have the committeeman on hand assist you in keeping people on their jobs.

a. Tell him directly and clearly what he is to do.

b. Be alert as to what he says and how he says it to workers.

c. If he is indifferent or unwilling to assume his responsibility, he can be charged with negative leadership or dereliction of duty.

3. Observe, remember and record significant happenings.

4. Do not leave the scene.

5. Get employees back by giving positive instructions: "You are in violation of paragraph 117 of the contract. Go back to work. Any problems you have can be handled through the grievance procedure after you go back to work."

6. Do not tell employees to go home. Do not say: "Go back to work or go home"; keep instructing employees: "Go back to work."

7. Do not argue merits of situation; stick to but one proposition: "Go back to work, and we will handle the problem through the grievance procedure."

8. Identify leader by determining who is . . .

a. Orally spreading information on a contemplated strike or stoppage.

b. Leaving department to obtain information on strike or stoppage in another area of the plant.

c. Waving or calling others off the job.

d. Shutting down machines or equipment.

e. Spreading a feeling of antagonism among employees over management's position on the issue in question.

f. Acting as spokesman.

g. Picketing or directing pickets. Showing negative leadership—union representatives standing by idly.

The following is the policy in regard to passes out of the plant should a work stoppage occur in your area or department:

1. Many employees may walk out without passes. They should be permitted to do so.

2. If passes are requested, they must carry a definite reason like: "Participating in a strike." "Refused to work." The time is important; record it.

3. Employees remaining and who are sent out because of lack of work, etc., should be given passes and the reason, such as: "Shortage of material due to a strike."

The supervisor becomes your primary witness to the violation. His actions are vital in sustaining your position in action against the workers taking the illegal action.

That's discipline, understood by all workers and expected as the inevitable consequence of contract or plant rule violation. It's important, too, he feels, to recognize that the union is fundamentally a political organization whose leaders must maintain their popularity with the rank and file to be re-elected.

Help—But while that puts the burden for discipline squarely on management's shoulders, look for union co-operation if your case is sound. Take the situation at a steel firm right after the war:

Largely through failure of a majority of the workers to vote, a local union president was elected who was determined to make a name for himself. His active search for grievances turned up such petty gripes as drinking fountains being too low, water in the fountains being too warm, food facilities lacking certain little-in-demand items, etc. On the strength of these gripes a tranquil labor situation erupted into a parade of wildcats. As fast as one grievance could be disposed of, two or three others were found to take its place.

When the company presented the facts to the union's national headquarters, the union agreed and quickly stepped in to place the local under an administratorship until a new election could be held.

Politics—Union political maneuvering is behind the majority of wildcat strikes. Example: At Studebaker (South Bend, Ind.) local officers originally agreed with the company to a revision in the incentive system. But the revision created a political issue which the "outs" were able to exploit in getting into power. Even at the department level a new committeeman is likely to start looking for gripes which will make him a name as a potential labor leader.

Most unions recognize that these men injure the majority of the workers by their selfish attempts to gain stature. For that reason when their efforts to prove their strength are met with severe discipline, the union leaders can then say: "See what happens when you listen to those bums? Now listen to us."

Requirement — That means a firm policy is needed in dealing with wildcat strike leaders, one with which they are familiar and which they can expect to be enforced. Leadership of a wildcat strike is viewed by many large firms as the most serious offense with which a worker can be charged, and the penalty is discharge.

That's why U. S. Steel Corp.

refused to back down on disciplinary action in its recent wildcat at the McDonald Works. It and other companies insist on handling the grievance through the normal grievance procedure and refuse to discuss reinstatement or the grievance until the workers return to the job.

Initial Cost — For that reason you must be prepared to take a loss of production to get the policy of inflexible discipline established. Alternatives: Contract observation or mob rule. The longer wildcatters have their own way, the more difficult and costly the establishment of discipline becomes. It will take a substantial period of experience to convince the workers that striking will only delay resolution of the grievance and cost them money. One firm at various times laid off over 500 workers to establish this principle. After a policy is established, however, most workers express favorable attitudes toward discipline. That's because the majority doesn't take an active part in union affairs, doesn't vote and doesn't go to meetings. They only want to work and resent wildcats but comply to avoid threatened retaliation.

Knowledge that as few as five or ten workers can no longer shut down the plant and throw 10,000 out of work gives the 10,000 an added sense of security. The rank and file recognize that they have as much to gain from a good program of discipline as management, and they are quick to see its benefits.

Keys — Employee-management respect and understanding of the rules, fair and prompt handling of grievances, plus understood and certain discipline for violation of plant rules or the contract are the keys to ending wildcat stoppages. Firmness but fairness must keynote the labor-management relationship, and the onus for establishing such a relationship is on management.

Although the union is a political organization, the political maneuvering takes place on issues created by management default.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*

Stainless, Ahoy

Steamship firm turns to stainless to reduce replacement costs of critical ship components

ISTHMIAN STEAMSHIP Co., is waging a "sea battle" against corrosion. It is using stainless steel in critical spots like large vent cowls, electrical gear housings, baffle plates in evaporators, drain tanks and small connections to the ship's hull.

Company engineers discovered that most items for its fleet can be fabricated out of stainless at a cost comparable to previous steels used by taking advantage of the greater strength-to-weight ratio of stainless. Thinner sheets can be used.

Examples of Savings — Boxes covering the cargo winch and anchor windlass brake boxes (housing vital electrical gear) had been pitting. Replacement was necessary on an average of every four years.

A replacement program was started using stainless steel boxes. Company officials, who estimate that $48,000 was being spent annually for replacement units, feel that this cost has been eliminated. Stainless units are showing no signs of corrosion.

By fabricating plates and baffles and the separator in the salt water evaporators out of stainless, an annual replacement cost of $14,000 has been wiped out.

Large vent cowls (above deck) always have posed a problem. Interiors are not accessible; without maintenance, cowls, which are expensive to replace, fail rapidly. Stainless units should last the life of the ship, Isthmian engineers predict.

Ore Addition for Kaiser

Kaiser Steel Corp. reports a multimillion-dollar addition to its iron ore mining facilities at Eagle Mountain, Calif.

Jack L. Ashby, vice president and general manager, says the addition will supplement a beneficiation plant that went into operation last year.

The facilities are expected to raise the shipping grade of Kaiser's ore to over 60 per cent iron content. Iron ore from the Eagle Mountain mine goes to Kaiser's steel mill at Fontana, Calif.

Pittsburgh Boosts Capacity

Pittsburgh Steel Co. has announced a $15 million-improvement program aimed at boosting basic ingot capacity 15 per cent (180,000 tons).

The project, centered at the Monessen (Pa.) Works, calls for 19 Koppers-Becker coke ovens which will add 25 per cent to Monessen's coke-making capacity, raising the total to 624,000 tons annually.

Three of the four stoves of Blast Furnace No. 1 will be changed into two-pass stoves. A Kinney gas-washer will be installed in No. 1 furnace. Open-hearth furnaces will be improved under a three-phase program.

The company also plans to diversify the range of welded wire fabrics to meet wider trade demands.

The program will be completed at intervals, starting May 1, 1956, and ending Mar. 1, 1957.

CAA Sees Big Gains by 1965

All facets of aviation figure to share in the continued expansion of the national economy. More people (via a growing population) are expected to spend more of their income on air travel. So predicts the Civil Aeronautics Administration.

By 1965, CAA expects 70 million passengers, more than double the 32.3 million in 1954. Air transport's share of the common carrier market will rise from its current 29 per cent to over 50 per cent.

The international and overseas passenger total for U. S. airlines will hit 6 million in 1965, up from 2.8 million in 1954.

The CAA sees a more promising outlook for air cargo. The forecast is an annual increase of slightly over 10 per cent a year. By 1965, 800 million ton-miles are expected.

To carry the traffic, CAA expects aircraft manufacturers will deliver 400 large civil transports in 1965.

Inland Steel Co.

Alcoa

ODM clamps down on granting tax amortization, but there's . . .

No Damper on Steel, Aluminum Expansion

FUTURE steel and aluminum expansion won't be hit seriously by Washington's move to curtail tax incentives.

The Office of Defense Mobilization, after consulting with the Defense Mobilization Board, has just closed expansion goals for primary aluminum as well as most of the basic iron and steel industry. That means future expansions in those areas won't qualify for five-year tax amortization. In steel, only heavy plate expansion will be considered for tax write-offs.

Steel—ODM's expansion goal for iron and steel (124.3 million ingot tons) has been exceeded by some 1.5 million ingot tons, reports ODM Director Arthur S. Flemming, when taking into account expansion under way and the amount which is in the final planning stage. This shuts the door, at least temporarily, on 66 requests for certificates of necessity (totaling $1.1 billion) which iron and steel firms have on file with ODM (for more on steel expansion see STEEL, Sept. 5, p. 41).

Aluminum—The primary aluminum goal for mobilization purposes is 1.7 million tons. Capacity in place, under construction and planned (see STEEL, Sept. 26, p. 69) brings the total to some 1.8 million tons, says ODM.

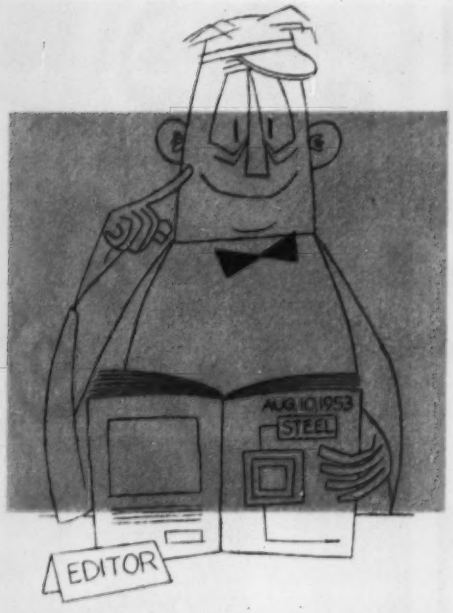
Of the anticipated capacity, 1.5 million tons is in place and Aluminum Co. of America has 65,000 tons under construction. Planned primary expansion calls for Harvey Machine Co. to build 54,000 tons of new capacity; Olin-Mathieson Chemical Corp., 60,000 tons; and Alcoa, 66,000 tons. Certificates of necessity, permitting rapid tax amortization, have been granted to Harvey and Olin-Mathieson and are still in effect. The Alcoa future expansion was planned without fast tax amortization.

Reaction—Republic Steel Corp.'s position is typical of the steel industry. It has applied for tax write-offs—and will continue to do so—just in case ODM switches its position (it has been known to do so). If it does not get certificates of necessity, Republic Steel says it still "will be able to cope with the problem." National Steel Corp. reports that it will continue with its expansion plans, regardless of the government's stand.

Meanwhile — Kaiser Aluminum & Chemical Corp. is still considering four projects totaling $104 million. It says the government's action does not mean that Kaiser's plans to increase primary aluminum capacity will be affected. Because Alcoa has already gone ahead on expansion plans without government incentives, it expresses no concern at the government's latest move. Reynolds Metals Co. is basing its expansion on "future markets," not federal amortization.

The only firm in the aluminum group to be seriously affected may be St. Joseph Lead Co. It is planning (with help from Pittsburgh Consolidation Coal Co.) to build a $85-million primary aluminum plant.

Andrew Fletcher, St. Joe's president, has stated that the government's policy toward increasing aluminum production would be an important factor in the final decision.



Reviewing a Forecast

DO ECONOMIC forecasts work out?

STEEL has re-examined a prediction (published Aug. 10, 1953, p. 57), which went out on the limb to estimate the trend in screw machine product shipments through August - November, 1955 — a 28-month forecast.

Batting Average — Some of the predictions: A recession in 1954 (it came); with 1940 equaling 100, an average index of monthly shipments at 350 for the period (the actual average was 369); a low index for the period of 280 (it was actually 287).

The National Screw Machine Products Association, Cleveland, made the forecast. It has statistics on its industry dating back to 1918. Executive Vice President Orrin B. Werntz has long been studying the cyclical trends revealed by those figures, which showed a peak-and-valley profile. The time between the highs and lows has averaged about 30 months. In making its forecast in the summer of 1953, NSMPA took the reasonably consistent cycles into account.

Accuracy — For a long-term prognostication, the figures are amazingly precise. The prediction falls short, however, in its timing. The low for the period was picked for now. It came 12 months early, in August, 1954.

"The drop for us—and practically everyone else—came unexpectedly fast," comments Mr. Werntz. Fortunately, the association saw the precipitateness in time to advise the industry. Recalls one member: "The whole forecast still had value. We simply advanced the timetable one year." He adds: "By using the predictions in our planning, we have been able to maintain average profits at 8.3 per cent before taxes for the 28 months, despite some rough times."

Significance — Besides showing how business forecasts can be put to work (see STEEL, July 18, p. 93), the NSMPA predictions have even wider interest. Screw machine product output reflects activity for industry generally. Screw parts are used as components by virtually every segment of metalworking.

Is there a prediction for another 28 months? Not yet. "We're going through an on-the-fence period," says Mr. Werntz, "and our industry won't know which way it will jump until about December." Other economists agree that it will take that long to see how 1956 auto models will sell, how next year's construction plans will jell and what effects government-applied brakes will have on the boom.

Robbing Peter? — Mr. Werntz and others are worried lest some of 1956's potential business steam already has been used for a high-pressure 1955. The original NSMPA forecast had a long uptrend starting now and continuing until early spring of 1957. That would be followed by a slump, with the next big push upward coming in the fall of 1959.

That pattern could still take shape. A long uptrend lasting from August, 1954, to February-April, 1957, is not unprecedented. The screw products industry has had one recent upcycle that was even longer—for 45 months from July, 1949, to April, 1953. That swing, incidentally, closely matched general industry experience.

If the upturn continues, NSMPA expects screw product shipments in 1956 to jump 10 per cent over the $500-million value anticipated for 1955.

NACA Plans Atomic Plane

The government plans to set up a $4.5-million nuclear reactor for development of an atomic airplane.

Sandusky, O., has been picked by the National Advisory Committee for Aeronautics as the site for a research test installation.

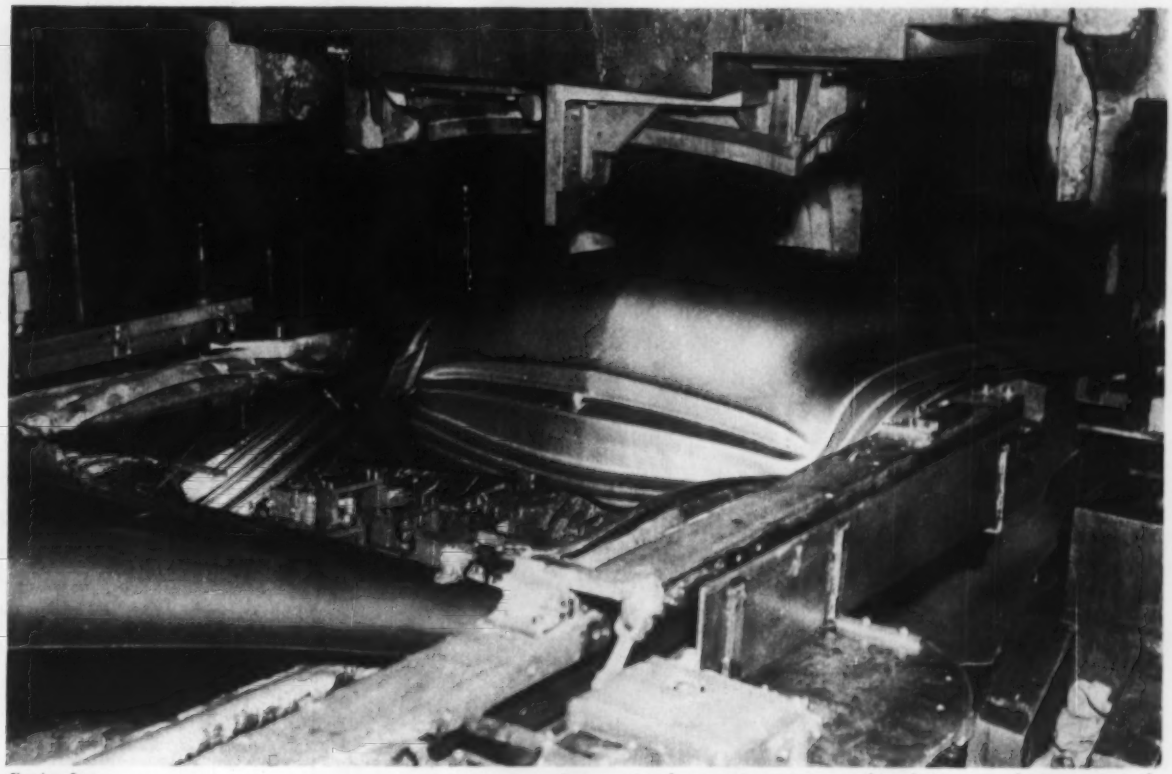
Dr. E. R. Sharp, director of NACA's flight propulsion laboratory, Cleveland, said the reactor will be part of a "sustained attack on technical problems which must be solved before a nuclear-powered aircraft can be flown."

Railroads To Get New Flatcar

An all-welded flatcar (the PS-4) is the newest answer to railroading's needs for a rugged, general-purpose carrier.

Fourth in a series of low-cost, mass-produced freight cars, the PS-4 can be adapted for bulkheads or piggyback hauling.

Pullman-Standard Car Mfg. Co. will make the units.



Chrysler Corp.

Automatic, faster operations and a better product are trends

Stampers Pound Out a Good Year

"SHIPMENTS of stampings may jump 25 per cent in the next 90 days." So says H. A. Daschner, Pressed Metal Institute, Cleveland. Reasons: New car production will get rolling. Appliances, housewares, sporting goods and toys look for a Christmas boom.

Jobbing stampers didn't begin to top their 1954 rate of production until June and July. But orders have been well over 1954 levels. Backlogs average 13 weeks.

The Leaders—Some aggressive promotion-minded stampers report 1955 first half sales are 32 to 66 per cent over the first six months of 1954. C. C. Caditz, president of Northern Metal Products Co., Franklin, Ill., says: "Sales in the first half were up 30 to 40 per cent for us, and in the second half, we expect to do as well, perhaps a little better."

Shipments this year will be about 10 to 15 per cent better than last year's. Next year should be as good or better than this one.

A Pinch—Steel shipments from the mills are tight; some purchases have had to be made from warehouses. Brass supplies are another cause for concern. Use of aluminum has increased by one-third to one-half in the last three years.

Increased material costs have brought on price boosts averaging 5 to 6 per cent. Labor increases have forced some prices even higher.

The nation's 2400 jobbing stampers are busy; employees work an average of 42 hours a week. About 5 per cent of the stampers are working double shifts. But, they say, profits are less than adequate. The enormous capacity of the industry sharpens competition and squeezes profits.

New Business—Increased use of stampings in automobiles makes the stampers happy. Industrial wheels, lighting fixtures, clocks, telephones and toys are other big users.

Atom Industries Hold Meeting

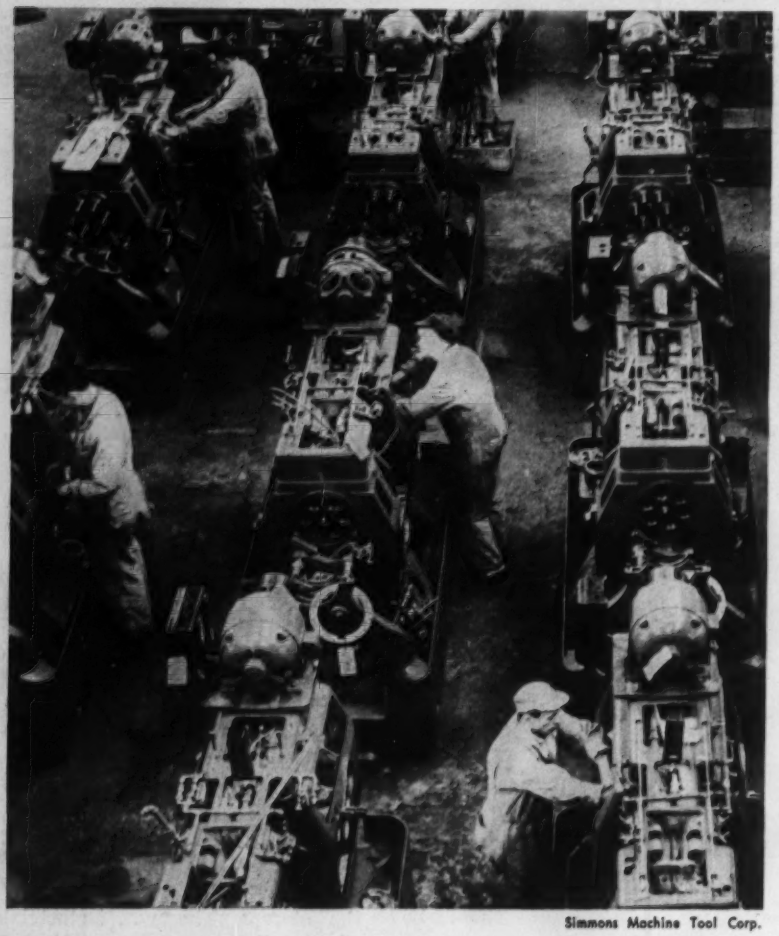
The first U. S. atomic industry trade fair was held in Washington last week.

Most of the 74 exhibiting firms were not in existence a few years ago.

A simultaneous meeting of the Atomic Industrial Forum Inc. discussed business opportunities. Indications are that atomic industry growth may closely parallel the history of automobile expansion.

Francis K. McCune, GE's atomic products division vice president and general manager said in a forum address that industrial sales prospects are being stymied by too much government secrecy and too little leeway in nuclear fuel exports.

By E. C. KREUTZBERG *Washington Editor*



Simmons Machine Tool Corp.

A survey points the way to new purchases as . . .

Navy Tools Grow Old

SATISFIED with the results obtained from an introductory survey on machine tool obsolescence, the Navy's Bureau of Ships is "looking" at the rest of its tools.

In explaining the new yardstick which will be used for formulating procurement plans for fiscal 1957, Alfred J. Weisbecker, Navy commander, states: "We propose to capitalize on the outstanding advances made in machine tool design since World War II."

Crux—The commander explained to STEEL that the initial survey (completed in July) reveals that the majority of its machine tools —in the 11 Navy shipyards and the San Diego ship repair facility —are 11 years old. This means they predate the "carbide age" and are below the present standard for machine tool performance and practices.

Statistics from the initial survey show: The 12 Navy facilities could be completely modernized over a five-year period by replacing 3496 obsolete tools with 2474 new machine tools of latest design. Based on the operation of 2½-shifts under mobilization, these new tools would save 3099 man-years annually. Floor space saved would be about 76,430 sq ft. Overall savings would enable the bureau to recover its invested capital within five years (under mobilization conditions).

Other Uses?—The obsolescence formula, a joint effort by the Bureau of Ships and the Machinery & Allied Products Institute, is being studied by the three armed services to see if the same type formula can be used with production equipment.

More Taconite Coming?

The United States Bureau of Mines has launched a research program to develop a commercial process for concentrating the nonmagnetic taconite ores of the Lake Superior region. Up to this time, emphasis has been placed on magnetic-type taconite which comprises only a fraction of the taconite reserves. The bureau estimates that this area contains some 60 billion tons of nonmagnetic taconite but has only 5 billion tons of the magnetic type.

Nickel Shortage Hurts

As high grade nickel is essential for the production of electron tubes and electronic equipment, industry spokesmen are warning the Business & Defense Services Administration that the continuing shortage of nickel may force electronic manufacturers to curtail production. BDSA's reply: There is little hope for improvement at this time.

Here and There

Field offices of BDSA report that a preliminary survey indicates that flood damage will cost the Northeastern states some $156.8 million. Connecticut was hit the hardest ($72.5 million) . . . The Office of Defense Mobilization has authorized the Defense and Commerce departments to begin rental charges 90 days after the delivery of machine tools and equipment to flood victims. Reason: This will assure that the rented equipment is in operation.

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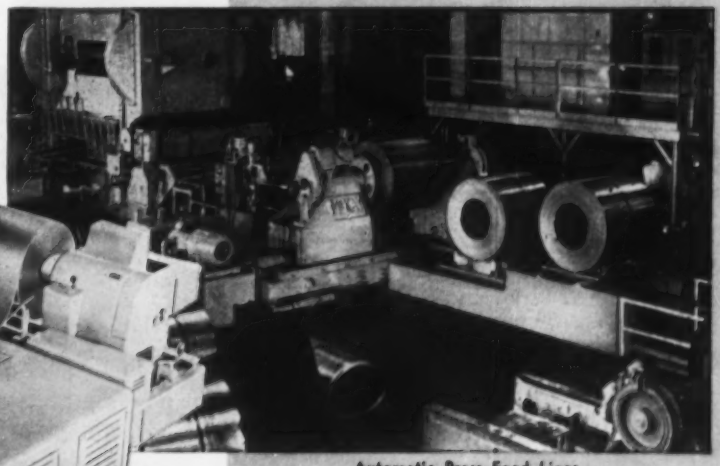
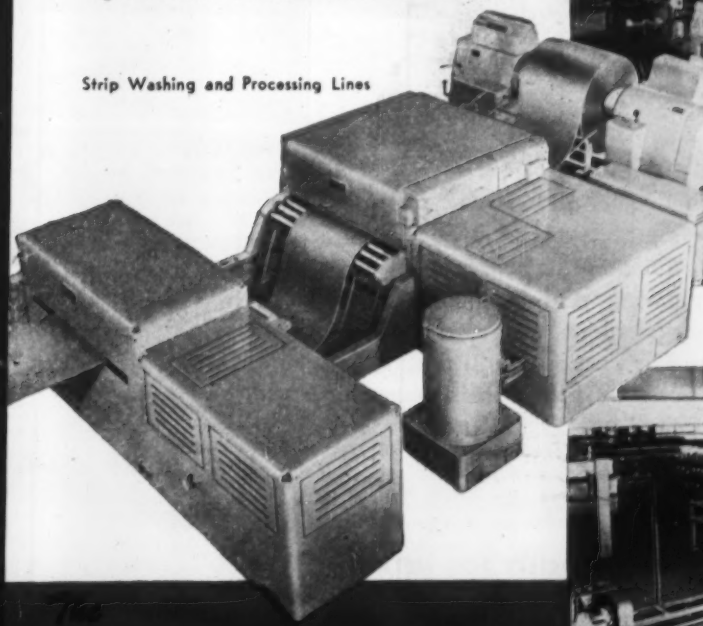


Automatic Press Feed Lines

Strip Washing and Processing Lines



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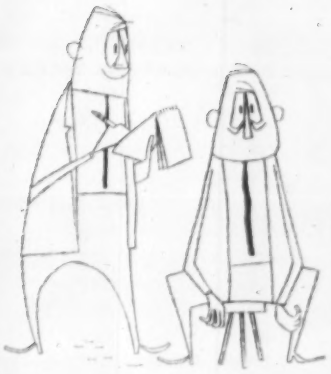


Ken Piper Says: "Study Each Worker"

"YOU DEAL with employees as individuals rather than as a group. To me that's the basic difference between industrial relations and human relations," says Kenneth Piper, director of human relations at Motorola Inc., Chicago.

For Motorola, consideration of the employee as an individual is paying big dividends: It never has had a major labor problem.

"In all our programs," Mr. Piper emphasizes, "we attempt to provide the element of individual decision. This supplies the basic recognition an employee needs."

Two Examples—In the company's profit sharing program, no changes can be made without the approval (by vote) of the employees. In the executive development program, the individual plans his own course of studies and interests. Then he sits down with management officials to discuss his outline and get suggestions. But the basic program is developed by the individual and is never a prepared plan which the employee must follow.

Many industrial relations departments, Mr. Piper believes, are too wrapped up in what they're doing today and should have done yesterday—labor relations then become a contest between management and the union.

Brain Storming—Successful human relations, he points out, takes a great deal of creativeness. First, management must be sure that its attitudes are such that they can be lived with, without sacrificing basic control and discipline. Then management must study what drives and motivates employees to get results. Crux: You have to anticipate problems far enough ahead so that solutions are ready.

"We developed our profit sharing program in 1948 because it was obvious that the Christmas bonus meant little to the employee a month after he received it. But today's $25 million in the profit-sharing fund is important to every employee—it's not company money, it's theirs."

Ken Piper's career didn't begin in employee relations. After attending UCLA and Loyola Law School, he became an agent for the Federal Bureau of Investigation. He worked in several field offices and wound up in Washington as director of personnel. In 1943 he left the FBI to be director of industrial relations at Bausch & Lomb Optical Co. He joined Motorola in 1948.

For diversion, he likes sports. How's his golf? "Well," he smiles, "maybe if human relations weren't such a big, full-time job, I'd be shooting in the 70s instead of the 80s."

Union Metal Mfg. Co.

With sales at $10 million, traffic signal makers say . . .

Green Means Go!

TRAFFIC SIGNAL manufacturers don't see any red lights ahead.

Their sales have hurdled from $4-to-$5 million level in 1946 to an estimated $10 million this year. The industry expects to hit the $20-million mark by 1965.

Expenditures—The Institute of Traffic Engineers, New Haven, Conn., reports that 34 states spent $6.9 million of their highway budgets on traffic signals in 1954. This breaks down to about 114,000 signalized intersections, 100,000 installed by cities and 14,000 by state highway departments.

Installation cost of a single unit runs about $1200. Putting signals on all approaches to an intersection can mount the cost up to $7000 or $8000.

Manufacturers — Six companies make most of the signals. There are perhaps ten more that manufacture signal equipment in addition to their regular lines. These companies also make directional markers, railroad crossing signals and inplant signal lights used by companies to control traffic in their industrial areas.

Components—Each traffic signal has at least two parts: The signal head and a control mechanism. Heads and control boxes are generally aluminum.

Some signals also have "detector" units which actuate controls. Steel or aluminum mounting poles and brackets usually are not considered part of the signal, but part of installation costs.

How They Work — Fixed-time and traffic-actuated signals are the two basic types.

Fixed-time signals are nothing more than time clocks. They can be adjusted manually, but their operational cycle, once set, does not vary. Traffic engineers say that fixed-time lights still are useful at minor crossings and rural intersections, but most of them will be replaced by traffic-actuated signals.

Go, Go, Go—Actuated signals operate on traffic demand. Detectors "count" or record the number of vehicles coming from a certain direction. When the demand reaches a peak, controls change the light.

Electronic, sound sensitive, photoelectric and magnetic detectors are being used as control actuators. Pressure-sensitive treadle detectors are most popular—the same devices open supermarket doors automatically. Each uses as much as 200 to 300 lb of steel in its construction.

In some cases main routes stay green until side street traffic demands the "go" sign. Pedestrian traffic usually is included in the cycle. At some corners pedestrians get the right of way by pushing a control button mounted on a street corner bracket.

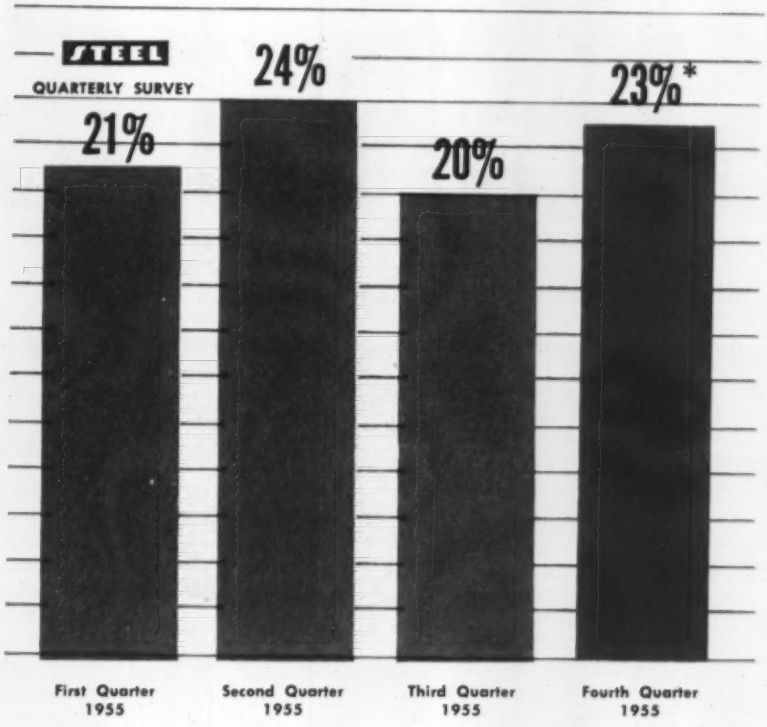
New Wrinkles—More and more traffic signals are being set up to operate on a system basis. Individual light controls are on the way out. Flexible synchronized controls are being installed to meet hourly changes in traffic over a wide area.

Radio - controlled pre - emption units are being placed on police cars and ambulances. These units automatically give emergency vehicles the right of way by turning crosslights to red.

Light in the Sky — Although some traffic experts say there are too many lights in the wrong places, traffic signal makers feel that increased highway expansion, automobile production and public demand for safety have given them the green light.

Major Industrial Components

(% of respondents who added to inventories)



Survey includes: Bearings, castings, hose couplings, cylinders, electrical equipment, fasteners, forgings, gears, mechanical rubber goods, screw machine products, springs and wire shapes, stampings and weldments

*Respondents' estimates

Supplies Improve Slightly

INDUSTRIAL COMPONENTS will be a little easier to come by in the fourth quarter. That's the indication of STEEL's regular quarterly survey of the inventory and delivery situation.

Reinforcing that conclusion: Half the respondents feel they'll be better off inventorywise three months from now. In the two preceding surveys, only one in three viewed the coming quarter so optimistically.

Output—That the inventory improvement won't be because of a slowdown in production is pointed to by 80 per cent of the respondents. Those users will maintain inventories at or above present levels or will involuntarily have lower stocks because they can't get wanted items—it's still a long way from a buyers' market.

Spotty and sometimes serious shortages are likely in some components. Witness: Three-fourths of the respondents report difficulty getting one or more components, 5 per cent more than last quarter.

Too Low—Also, the number of firms expecting to be in a worse position in three months doubled for the second straight quarter. In the latest survey, those saying they'll be worse off (almost 10 per cent) report it's because stocks are too low.

Much of the difficulty in components can be tied right back to hard-to-get steel, copper and aluminum. "Deliveries will probably get worse because of the shortages of copper and steel," says one executive. Others point out the same situation and add aluminum.

Difficulty—Complicating the situation is this problem: "Deliveries are generally adequate if the supplier is given normal lead time. The trouble is our customers are expecting us to give them deliveries on our products on short notice."

Components giving the most trouble on deliveries are antifriction bearings, malleable iron and steel castings, forgings, air and hydraulic cylinders and many kinds of electrical equipment. One-fifth to one-fourth of the users of those products aren't satisfied with supplier performance. On most other components, less than 10 per cent of users complained.

How much trouble you have depends pretty much on what you buy. Fabricators who buy parts as they are needed to fill a customer's order are probably having the toughest time. One manufacturer says: "Deliveries generally are extending, causing difficulty in procuring material which is purchased directly for customer orders."

Hot Spots—On the other hand, a freight car builder (most of this industry traditionally buys only to fill a specific contract) reports: "On car contracts received in late August and thereafter, we will have great difficulty with steel mill products but not with other components."

Increase — A reason for many firms feeling in fairly good shape is the small but welcome inventory build-up that came over the summer. But it's still not so big as PAs had hoped for. A quarter ago, plans of 25 per cent of the respondents called for larger stocks; only 20 per cent managed to get them.

Brightening that inventory picture: For the first time since deliveries tightened about six months ago, there was a significant movement out of the "less than ten-day supply" category.

On most items the bulk of respondents indicate a 10-to-60-day inventory. There was some movement into the 60-to-90-day group, but a good share of that came from a reduction in stocks by holders who three months ago were in the three-to-six-month category.

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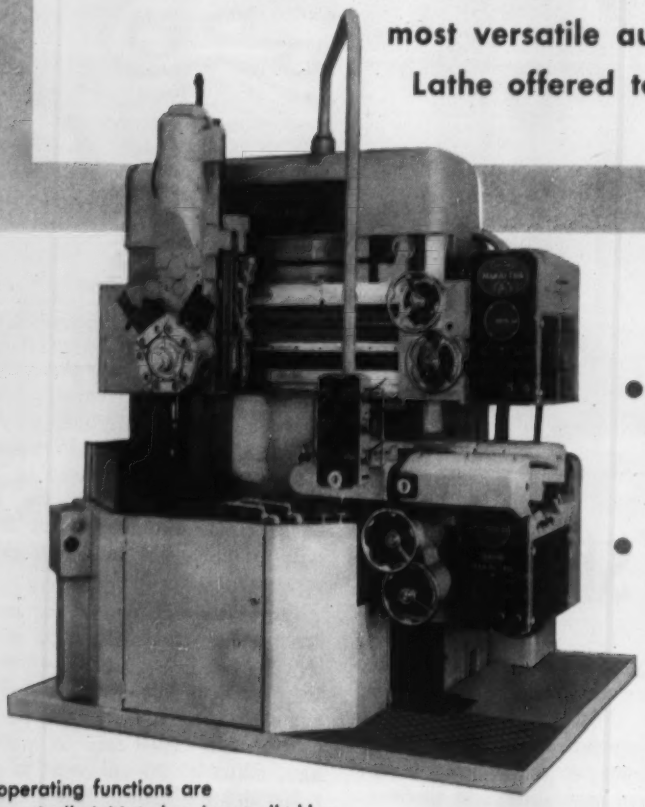
Yes, Bullard Cut Master, Model 75 with Man-Au-Trol Conversion Unit is the best . . . most versatile automatic Vertical Turret Lathe offered to industry today . . . . .



BULLARD

All operating functions are automatically initiated and controlled by one function control drum and two detector drums in Man-Au-Trol: Table Speeds (20 Available), Feeds (16 Available), Head Travel in feed or traverse, right or left, up or down or 45° in any quadrant and Turret Indexing.

Since the function control drum can be pre-set for a given job in advance, the machine down time for job change-over is reduced to a minimum.

The Man-Au-Trol Conversion Unit can be applied to any or all heads of Cut Master, Model 75 right in your plant.

Your Bullard Sales Engineer will be glad to explain the many other advantages offered by Man-Au-Trol — your best buy in an automatic vertical turret lathe — call him or write for our new catalog.

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Auto Facts Hit the Roads

Statistics show: If anything curtails motordom's long-term growth, it will be inadequate highways, not bad times or a drop in population

HIGHWAY TRAFFIC in the U. S. will double in the next 30 years, says Stephen M. Du Brul of General Motors Corp.'s business research staff. If that doesn't make you feel like taking flying lessons, Mr. Du Brul has a clincher: If adequate highways are provided, highway traffic may well triple.

No Road?—The difference between doubling and tripling could amount to a fairly hefty piece of change for the automakers. With values of vehicles produced at $10 billion in 1950, $11 billion in 1953 and a possible record of over $13 billion in traffic jammers for 1955, the automakers have their production foot to the floorboards, as the specter of literally running out of road begins to loom ahead.

Like any motorist in the same situation, the automakers are beginning to feel a bit uneasy. Unlike most motorists, however, rather than hitting the brakes, they're moving ahead with long-range expansion plans and calling for more roads. And there's excellent evidence that more roads are needed. While highway travel has increased five-fold since 1920, our highway construction program hasn't increased nearly so much.

Another Picture—That stands in marked contrast to other factors influencing the auto market. For example, the number of families above the $3000-per-year income level has increased 73 per cent during the last 14 years alone. By this same measure, seven out of ten families today top that figure and over half exceed $4300 yearly.

At the same time, the population of the U. S. has been increasing. The net result is that where there are now 5 million fewer families in the income range below $3000 than before the war, there are 15 million more families with incomes above $3000. This incredible increase is a major factor behind the current record-breaking level of automobile sales and the trend is continuing.

Basis—Mr. Du Brul believes that the typical family income should exceed $8000 after taxes in 25 or 30 years, measured in terms of today's dollars, compared with $4300 now. These factors, plus increased leisure time for travel and recreation, will have a profound effect upon the nation's future highway needs and lead to Mr. Du Brul's estimates.

If you hadn't discovered it already, there's a sufficiency of auto traffic for most drivers. Today, there are 61 million registered motor vehicles and 72 million licensed drivers in the U. S. piling up mileage at the unprecedented rate of more than 560 billion miles a year. That's about 9200 miles per vehicle and 7800 miles per driver, just in case you'd like to know how your contribution stacks up.

Decade Ahead—Just looking ten years ahead, motor vehicle registrations and travel mileage on the nation's highways are due to increase more than 33 per cent. To correct highway inadequacies during that period alone, the Auto Manufacturers Association estimates that $101 billion is needed. The organization estimates that inadequate roads today are costing U. S. motorists more than $5 billion per year, about half the amount needed annually. That estimate is based on traffic accidents, commercial vehicle time loss, losses in gasoline mileage, brakes and tire economy and vehicle operating costs on unimproved roads scheduled for surfacing. When to that is added the fact that 24 cents out of every dollar spent for the purchase of an automobile goes into taxes, it's the more remarkable that the highway program is dragging.

Despite all that, 70 per cent of the world's passenger car production is in the U. S. Of world passenger car registrations, 73 per cent are in this country. About 71 per cent of the nation's families own at least one automobile and 12 per cent of car-owning families own two or more cars. Two out of every three passenger cars produced and three out of every four trucks produced in 1954 were sold as replacements for vehicles scrapped. That means one out of every three passenger cars produced is an addition on the highways. Despite the economic climate forecast over the years ahead, inadequate highways could begin to choke off the flow.

Reason Why—That's for the not-too-mysterious reason that as traffic increases, the utility of the passenger car diminishes accordingly. There's nothing quite so worthless as an auto in a mile-long traffic jam or a car without a parking space. Improvements in other sources of transportation could begin to curtail demand for autos. In a real sense, the success of the

Automotive Retailer Sales: $43 Billion in 1954

(millions of dollars)

	Motor Vehicle and Other Automotive Dealers	Tire, Battery and Accessory Dealers	Gasoline Service Stations	Total
1954	$29,961	$1,705	$11,445	$43,111
1953	31,499	1,820	10,537	43,856
1952	26,393	1,944	9,976	38,313
1951	26,282	1,874	9,151	37,307

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automakers could prove their undoing as the increasing hordes of autos diminish their own utility on overcrowded streets.

The nation's 701,326 automotive firms that sold a record $43.8 billion in cars, accessories, gasoline, etc., in 1953 can comfortably expect to see that figure bettered in 1955. It could well be doubled in 25 years. And keynoting the growth for new businesses is the fact that 20.4 per cent of all patents issued in 1954 were automotive devices.

Roads ahead mean a great deal, not only to the motorist facing daily traffic but also to the auto industry and the economy.

Exhaust Notes

Although Buick will introduce a newly designed rear end for 1956 to handle increased engine output, watch for this GM division to become the first American car manufacturer to introduce an independent rear suspension. Used on European cars like the Porsche, Mercedes and Lancia, this unit reduces unsprung weight, improving both ride and roadholding characteristics. Buick will use this unit in preference to the hydraulic-pneumatic suspension similar to that of the Citroen which will bow on other of the GM makes in 1957.

Studebaker is readying an answer to the Thunderbird, Corvette and Chrysler 300. The Studebaker Speedster for 1956 will have a Packard engine rated at 285 hp or better, and, with the car's low frontal area and clean design, should top 130 actual miles per hour. Installation under the hood is about the tightest ever accomplished, and the car probably won't handle without some reworking with the Packard engine mass in the front end. But when it comes to drags, the Speedster ought to be the 1956 champion . . . probably in the top speed department as well.

As reported some months ago, all makes are presently readying four-door hardtops. With GM getting the drop in its B-bodied series (to be available this year in all three, A, B, and C), other makes are unable to introduce until about January. But don't give up, they'll all have it among the Big Three by early next year.

Chrysler Corp., incidentally, is readying a sports car to be coming along in mid-1956. It probably will be designated the Falcon and be the property of Dodge Division. A good news note for sports car enthusiasts: Those in the know say this car was conceived with competition on the race course, not the salesroom, in mind.

Thunderbirds, incidentally, not to be announced until late this year for 1956, will have 225 hp. Styling facelifts include new porthole windows in the rear quarter area of the hard top to improve visibility. A new Corvette in both the convertible and fast back models is reported coming in 1956 and should really boost interest in the machines. Windup windows are reported to be a feature of the cars, along with an adaption of the ball-joint suspension on passenger cars to get handling into the competition class.

On the subject of competition, Mauri Rose is reported in charge of Chevrolet competitive activity at "stock car races all over the country." Ford is in the process of setting up a racing department as well. Chrysler, now forming a "Chrysler 300 Owner's Club," won't be far behind as the automakers get the message that racing victories sell cars. That's because, believe it or not, auto races of various sorts draw more spectators than any other sport in these United States.

Somewhat along the same lines, prizes to hot rodders competing in the national speed trials of the National Hot Rod Association at Great Bend, Kans., this weekend received engines donated by the automakers as prizes. Safety is getting today's headlines, but good old dig is not forgotten and handling is being discovered.

Watch for limited slip differentials to gain prominence among the automakers. Tests being conducted by Willys with a Detroit product, Hi-Tork, have shown amazing results in improving off-the-road traction. Other automakers are finding marked improvement in roadability and freedom from wheel spin under all conditions. Packard will introduce the device on 1956 models, and other automakers probably will follow by 1957. Costing only about $20 to install, this device will virtually eliminate stuck cars during the northern winters.

Auto, Truck Output

U. S. and Canada

	1955	1954
January	780,780	594,467
February	770,530	574,215
March	955,027	672,858
April	936,994	676,269
May	913,257	621,318
June	825,031	635,540
July	815,324	543,344
August	736,039†	523,799
September		364,441
October		312,078
November		616,395
December		761,954
Total		6,896,678

Week Ended	1955	1954
Aug. 27	155,233	113,496
Sept. 3	105,680	110,995
Sept. 10	98,546	84,743
Sept. 17	146,484	74,026
Sept. 24	152,171†	72,804
Oct. 1	160,000*	84,110

Source: *Ward's Automotive Reports*
†Preliminary *Estimated by STEEL

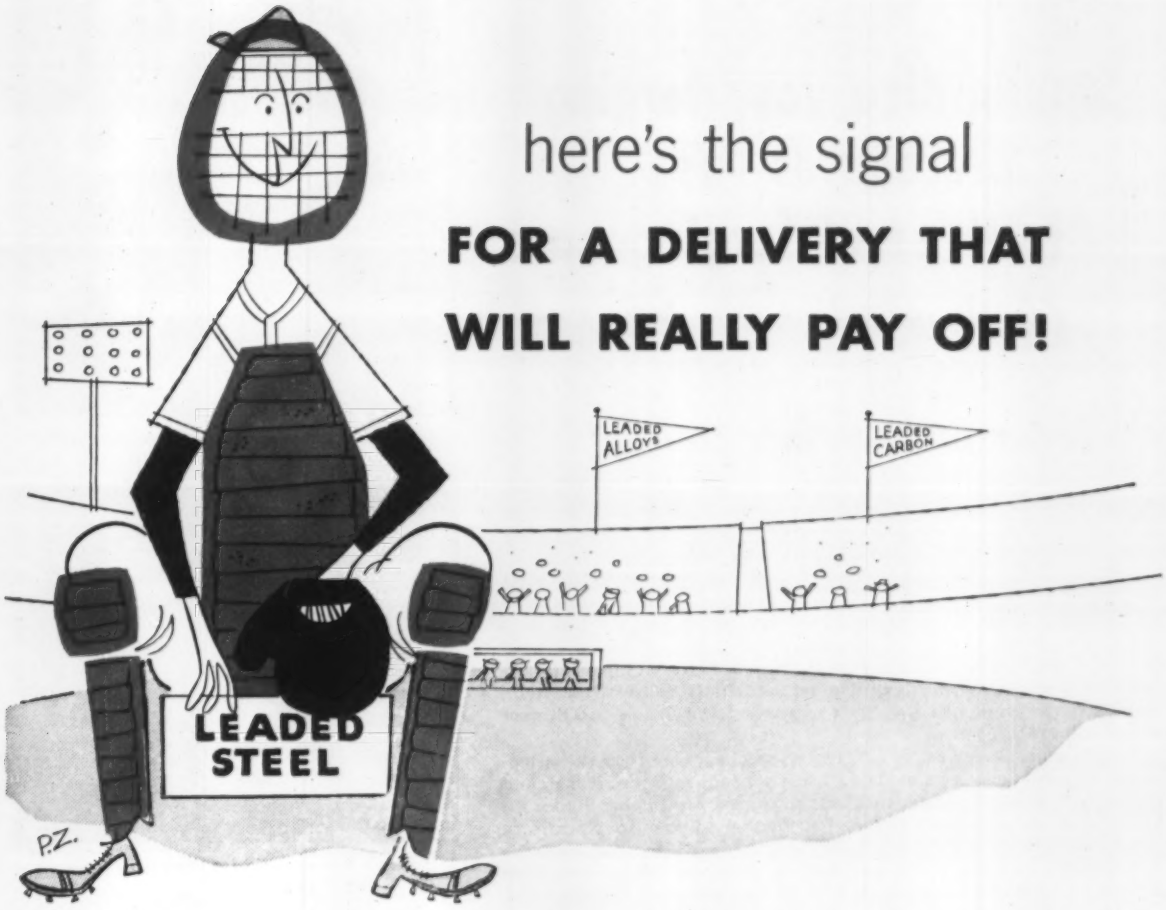
Ford Gets Research Contract

Ford Motor Co. has a one-year government contract to study emergency tank production.

Awarded by the Detroit Ordnance District, the contract's aims are: To determine the number of parts which have been changed on the M-48 medium tank since Ford ceased production in 1953. To find out if previously used production methods and equipment are adaptable to the current model. To study the capacity of present equipment to produce at a stated (confidential) monthly rate.

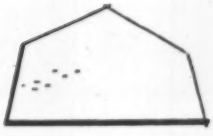
The contract is one of three being negotiated by Ford with military agencies. Their total: About $3 million. Purpose: Better industrial mobilization planning.

"Operation Readiness" is the voluntary program Ford has developed to handle these contracts. It has two main phases: To determine Ford's resources available for defense production and to match these resources with mobilization assignments.



here's the signal

FOR A DELIVERY THAT WILL REALLY PAY OFF!



Are high machining and tool costs knocking profit out of your daily battle for quality production?

Then here's the pitch—Try Aristoloy leaded steels. The faster feeds and speeds, freer machining and longer tool life of these steels will strike out excess tool costs and put production line breakdowns out of the game.

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For further details write for free booklet "Lead Treated Steels"

COPPERWELD STEEL COMPANY • STEEL DIVISION • WARREN, OHIO

Standardize your forging procedures—use TIMKEN® steel forging bars

60 chemical checks keep them uniform—order to order, heat to heat, bar to bar!

Etch testing of specimens in hydrochloric acid

NO need to change your forging procedures to fit each order of steel, when you use Timken® steel forging bars. Their quality is so closely controlled you can *rely* on their uniformity.

Every heat must undergo a series of *sixty* chemical checks that start with spectrographic analysis of the molten steel with the industry's first direct-reading spectrometer, and continue through to the final steps in manufacture.

This is one reason Timken steel forging bars have uniform physical and chemical properties, respond uniformly to heat treatment, have uniform grain size after heat treatment, and have good dimensional tolerances, too.

What's more, every order of Timken steel forging bars is "tailor-made" to meet your specific needs. Every subsequent order is matched to the first. And your order of Timken forging steel is handled individually in our mill and produced according to your specifications.

All this means you'll have fewer rejects, and less need to make furnace adjustments. You'll be working with steel of uniform high ductility and resistance to impact. With Timken steel forging bars, your forging procedures can be *standardized.*

Industry's first direct-reading spectrometer analyzes molten steel in 40 seconds

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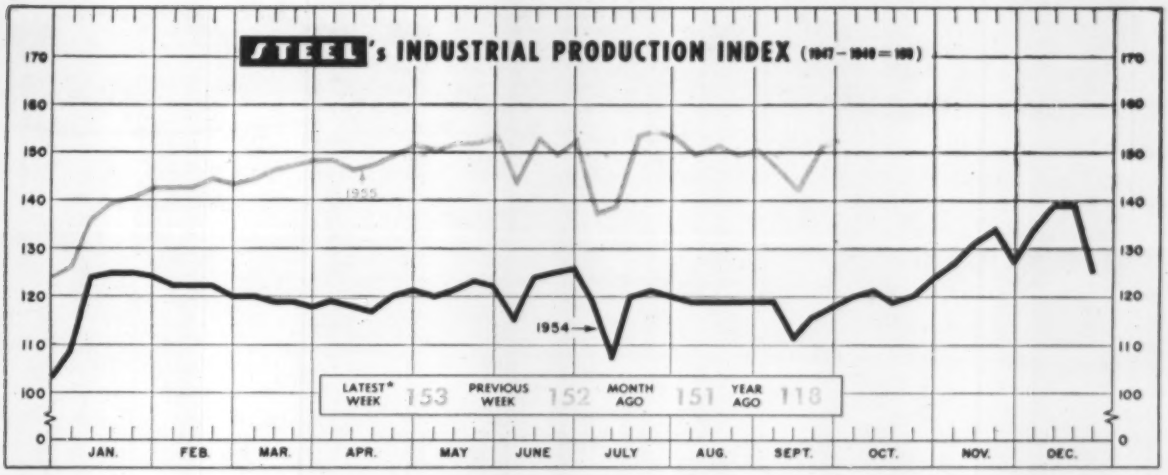
Our Technical Staff will help you choose the correct analysis for your forging job, based on their experience with many thousands of tough forging problems. Let us put your name on the subscription list for our technical bulletins on forging steels. They're free. Just write The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable: "TIMROSCO".

Titrating to determine analysis of steel

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Sept. 24. Based upon and weighted as follows: Steel Output, 35%; Electric Power Output, 32%; Freight Car Loadings, 22%; and Auto Assemblies, 11%

Behind the Boom: Consumer Is Able, Willing

GIVE THE consumer a pat on the back. He's one of the biggest supporters of the current business boom.

Right now he's spending at a record rate, somewhere near $250 billion a year. And it looks like he'll continue at that pace.

Optimism — Witness the forecasts for autos and housing in 1956: Almost as many cars will be sold next year as in this record year; housing is due for a dip, but it will be small—with the accent on small.

Reasons: Employment is high and figures to stay that way, so the consumer feels he's in a good spot to better his way of living.

Pay Gains—He's earning more, too. Factory workers' pay in August set another record. Net spendable weekly earnings were almost $71 for a worker with three dependents, $64 for a worker with no dependents—both categories up about 60 cents from the previous month.

What he's making will buy more. The climb in take-home pay, combined with a small decline in consumer prices, put the purchasing power of his paycheck at a new high—up about 8 per cent from a year ago.

Inflationary Bias—The price situation is important in another way. There is little chance of any major price break—hikes are more in order. So Mr. Consumer sees little value to be gained by putting off purchases in hope of lower price tags.

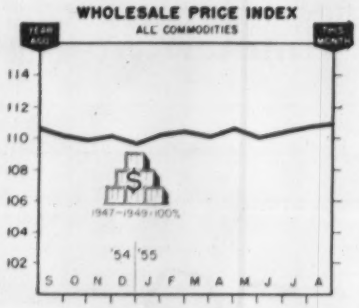
The clouds in the blue sky are these: People are spending more of what they make—94 cents on the dollar now, compared with 92 cents last year and in 1953. That means less of a cushion in a business dip, but, again, confidence is high that there won't be one. Consumer credit and installment debt continue to climb to new peaks. But finance companies report collections are excellent, indicating that consumers aren't going in over their heads. It adds up to

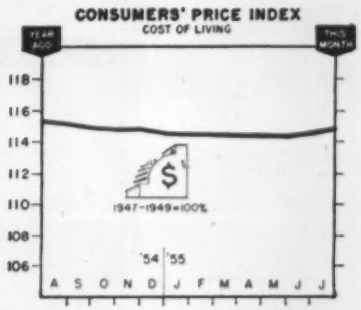
BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,316[1]	2,320	1,678
Electric Power Distributed (million kw-hr)	10,620[1]	10,580	9,074
Bitum. Coal Output (1000 tons)	9,975	8,570	8,055
Petroleum Production (daily avg—1000 bbl)	6,680[1]	6,684	6,198
Construction Volume (*ENR*—millions)	$433	$381	$341
Automobile, Truck Output (*Ward's*—units)	152,171[1]	146,484	71,904
TRADE			
Freight Car Loadings (1000 cars)	830[1]	822	711
Business Failures (Dun & Bradstreet, no.)	200[1]	191	195
Currency in Circulation (millions)[3]	$30,401	$30,520	$29,888
Dept. Store Sales (changes from year ago)[3]	+4%	+11%	0%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,682	$19,497	$21,045
Federal Gross Debt (billions)	$277.2	$277.9	$274.7
Bond Volume, NYSE (millions)	$23.0	$29.4	$15.4
Stocks Sales, NYSE (thousands of shares)	12,038	13,102	10,773
Loans and Investments (billions)[4]	$84,735	$84,150	$83,084
U. S. Govt. Obligations Held (billions)[4]	$30,940	$30,791	$35,790
PRICES			
STEEL's Finished Steel Price Index[5]	207.63	207.63	194.19
STEEL's Nonferrous Metal Price Index[6]	263.2	260.1	218.3
All Commodities[7]	111.4	111.4	109.2
Commodities Other than Farm & Foods[7]	117.9	117.9	114.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1955, 2,413,278. 1954, 2,384,549. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

THE BUSINESS TREND





	1955	1954	1953
Jan.	110.1	110.9	109.9
Feb.	110.4	110.5	109.6
Mar.	110.0	110.5	110.0
Apr.	110.5	111.0	109.4
May	109.9	110.9	109.8
June	110.3	110.0	109.5
July	110.6	110.4	110.9
Aug.	110.5*	110.5	110.6
Sept.	....	110.0	111.0
Oct.	....	109.7	110.2
Nov.	....	110.0	109.8
Dec.	....	109.5	110.1

U. S. Bureau of Labor Statistics
*Preliminary

	1955	1954	1953
Jan.	114.3	115.2	113.9
Feb.	114.3	115.0	113.4
Mar.	114.3	114.8	113.6
Apr.	114.2	114.6	113.7
May	114.2	115.0	114.0
June	114.4	115.1	114.5
July	114.7	115.2	114.7
Aug.	....	115.0	115.0
Sept.	....	114.7	115.2
Oct.	....	114.5	115.4
Nov.	....	114.6	115.0
Dec.	....	114.3	114.9

U. S. Bureau of Labor Statistics

Charts copyrighted, 1955, STEEL

this: As long as the consumer continues to wield the long green, business will stay good.

One of the beneficiaries is the appliance industry. Sales this year will be about 10 per cent higher than 1954's. Chances are 50-50 that 1956 will be equal or better. Availability of credit is one key, but it would have to become extremely tight to cause more than a minor dip. It's not looked for.

Newer appliances lead this year's sales parade: Dishwashers and clothes dryers measure the biggest gains. Gas ranges and water heaters are up 16 and 24 per cent, respectively, over last year. TV may not hit the peaks of a year ago at this time, but the annual total will be up several percentage points.

More Railroad Buying . . .

Railroads, responding to the 1955 pickup in their business, are becoming better metalworking customers. The backlog of freight cars on order is 52,803, four times what it was a year ago, up 10,000 cars from a month ago.

Rising outturn is accompanying the rise in backlogs, reports Association of American Railroads. Some 3480 cars were delivered in August, compared with 2192 in July.

Prospects are good for the splurge to continue. Early predictions of fourth quarter freight car loadings say there will be substantial gains over a year ago. And car loadings are how railroads make their money.

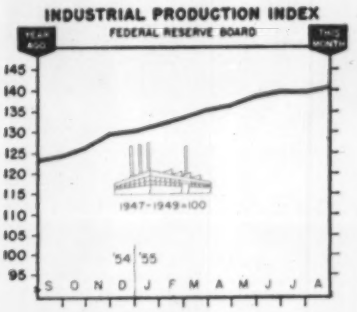
Furnace Sales Stay Hot . . .

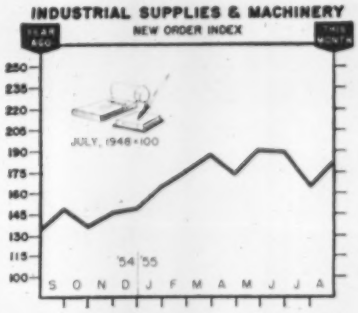
Industrial furnace makers continue to enjoy good business, reports Carl L. Ipsen, executive vice president, Industrial Heating Equipment Association. Orders for furnaces in August were $6.3 million, 144 per cent more than in that month of last year. Induction and dielectric heating equipment had August sales of $1.7 million, about double what they were last year.

For 1955 to date, net orders for furnaces and control equipment are $53 million, up 77 per cent from a year ago.

Construction Builds Up . . .

Heavy construction continues to rebound from its mild, short-lived dip in July and August. Latest weekly contract awards were $433





(seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1955	1954	1955	1954	1955	1954
Jan.	131	125	127	111	156	155
Feb.	133	124	131	108	157	152
Mar.	135	123	135	103	158	148
Apr.	136	123	138	104	160	146
May	138	124	140	106	162	147
June	139	124	143	108	163	145
July	139	124	134	104	167	148
Aug.	140*	123	141*	105	169*	148
Sept.	...	124	...	117	...	148
Oct.	...	126	...	110	...	149
Nov.	...	129	...	118	...	155
Dec.	...	130	...	120	...	156
Avg	...	125	...	110	...	150

Federal Reserve Board. *Preliminary

	1955	1954	1953
Jan.	164.4	139.8	157.4
Feb.	175.1	140.5	172.9
Mar.	186.9	141.5	188.2
Apr.	173.7	131.9	182.1
May	191.6	129.4	171.1
June	189.1	136.4	160.0
July	163.7	119.4	155.3
Aug.	....	132.5	139.6
Sept.	....	148.1	150.6
Oct.	....	136.3	146.0
Nov.	....	146.2	144.8
Dec.	....	148.8	136.7

Amer. Supply & Machinery Mfrs.' Assn.

million, reports *Engineering News-Record*. Total for the year to date is a record $13.9 billion, 31 per cent above a year ago and 16 per cent over the previous high of 1952.

Private construction continues to provide the backbone of the boom. Mass housing is one of the strong points. It has racked up $4.7 billion for the year, 49 per cent higher than a year ago. Industrial building continues its upward surge.

PAs Have Optimism . . .

"There is little doubt in the minds of purchasing executives that business can do anything other than remain on its present high plateau throughout the balance of 1955 and into 1956," says the National Association of Purchasing Agents.

High production is one of the reasons. A record 93 per cent of the PAs report a production gain in September over August. Prices, too, are high, but that doesn't seem to be discouraging buyers.

Inventories are a little stronger, but many of the PAs would increase their stocks even more if they could get the materials. (See STEEL's own survey on the situation in industrial components, page 49.)

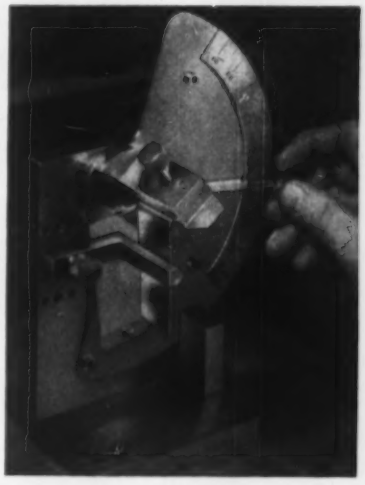
Buying Policy Lengthens . . .

Thirty per cent report higher stocks, reflecting mostly PAs who have liberalized their buying time. About a quarter report inventories lower without any intentional effort on their part to reduce them. Greater demand than supply and high consumer spending are the big factors in keeping inventories at a lower level than might seem justified in such a high production period.

Buying policy continues to lengthen. Almost half feel that the 90-day-and-over range is the necessary lead time on production materials. On MRO supplies, though, most are in the hand-to-mouth to 60-day basis. Only a quarter are willing to extend to a 90-day interval.

The employment picture presents the same general optimism of the rest of the survey. Sixty per cent report employment the same as last month, many adding, "at the same high level." Only 6 per cent noted a decline, and most of those had some kind of "plausible explanation."

MONEL • NICKEL • COPPER • ALLOYS
THIN STRIP
no standard is too exacting



Temper requirements for the thin nickel strip (.002") used in sensitive electronic tubes were too exacting to be checked by the usual methods. So Somers carefully hand checks several samples from each lot by the ultra-precise "bend test" illustrated above.

Since 1910 Somers Brass Company has specialized in producing thin strip: nickel and its alloys below .020" and copper and its alloys below .012" with the tensile properties, fatigue resistance, drawing properties and many other requirements which only the most exacting standards of production and quality control can meet.

Whatever your specifications may be, why not take advantage of Somers long experience? Write for field engineer or Confidential Data Blank for a complete survey of your problem at no cost or obligation.

FOR EXACTING STANDARDS ONLY
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Somers Brass Company, Inc.
WATERBURY, CONN.

Thumb Replaces Spot Welder with Tinnerman SPEED NUTS!

Here is a typical assembly-line scene . . . a Tinnerman "J" type SPEED NUT being applied to a panel where a weld-type fastener was formerly used. That's the way to cut assembly costs—by saving precious man-hours and eliminating the need for special skills, tooling and equipment!

This one-piece, self-locking, spring steel SPEED NUT brand fastener not only makes welding unnecessary, but it also eliminates clinching, staking, tapping, and costly threaded inserts. It snaps in place by hand quickly, easily, and provides a heavy-duty vibration-proof attachment. Self-retained in screw-receiving position, it is ideal for blind-location assembly.

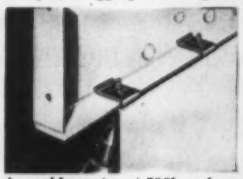
"J" type SPEED NUTS are available for a full range of screw sizes and panel thicknesses. In all, there are more than 8000 variations of SPEED NUT brand fasteners to help you reduce assembly costs. See your Tinnerman representative soon . . . and write for your copy of SPEED NUT "Savings Stories."

TINNERMAN PRODUCTS, INC. • BOX 6688, DEPT. 12, CLEVELAND 1, OHIO

Canada: Dominion Fasteners, Limited, Hamilton, Ontario. *Great Britain:* Simmonds Aerocessories, Limited, Treforest, Wales. *France:* Aerocessoires Simmonds, S. A., 7 rue Henri Barbusse, Levallois (Seine). *Germany:* Hans Sickinger GmbH "MECANO", Lemgo-i-Lippe.

TINNERMAN Speed Nuts®
FASTEST THING IN FASTENINGS®

"J" type SPEED NUTS eliminate problems of hole misalignment and paint clogging on heating unit.



Assembly costs cut 50% on farm equipment with "J" type SPEED NUTS.

"J" type SPEED NUTS help plastic sign maker save 48% in assembly costs.

More than 8000 shapes and sizes

JAMES M. DARBAKER
. . . Copperweld Steel president

GEORGE BAILLIE JR.
. . . sales mgr. of Bliss rolling mill

WILLIAM M. BURR
. . . heads dept. at Control Engineering

James M. Darbaker was elected president, **Copperweld Steel Co.**, Pittsburgh, to succeed **Frank R. S. Kaplan**, now chairman of the board. Mr. Darbaker was senior vice president. **Henry G. Riter III**, president of Thomas A. Edison Inc., was elected honorary chairman of the board and chairman of the finance committee.

R. G. Halvorsen fills the new post of executive vice president of **Hamilton Mfg. Co.**, Two Rivers, Wis., and was elected a director. He was vice president-sales. He will co-ordinate sales, manufacturing and research activities.

William E. Fowler and **Herman J. Spoerer** were elected vice presidents of **Youngstown Sheet & Tube Co.**, Youngstown. Mr. Fowler was general traffic manager. Mr. Spoerer was director of industrial relations.

Norman W. Calkins, formerly with Carpenter Steel Co., joined **Universal-Cyclops Steel Corp.** as assistant manager of tool steel sales and assistant to W. J. Long, vice president. Mr. Calkins will have headquarters at the Cyclops Division, Titusville, Pa.

William N. Rathbun was made plant facilities engineer at **Temco Aircraft Corp.**, Dallas. **James F. Parrish** succeeds Mr. Rathbun as chief industrial engineer.

George Baillie Jr. was made sales manager of **E. W. Bliss Co.'s** rolling mill division at Salem, O. He has been acting sales manager since January.

Robert C. Baumgartner was appointed general sales manager of **Oster Mfg. Co.**, Cleveland. Associated with Oster for 20 years, he has been export manager for the last nine years.

George R. Trumbull was made general sales manager, **Westfield Mfg. Co.**, Westfield, Mass., subsidiary of **Torrington Co.** He succeeds **Charles J. Fogarty**, who retired Sept. 1 as vice president-sales manager. **Joseph A. Sarka** succeeds Mr. Trumbull as Torrington's manager of distributor sales, antifriction bearings.

Union Twist Drill Co., Athol, Mass., elected **Stanley Holland** president to succeed **George F. Holland**, now chairman of the board. **John C. Molinar** was named vice president-sales; **Rossiter Holt**, vice president and general manager of the S. W. Card plant; **John Engelsted**, vice president in charge of production of the Union Twist Drill plant.

Paul L. Bruhn was made division manager of Republic Steel Corp.'s **Berger Division**, Canton, O. He has been acting division manager since January.

William M. Burr heads the new aircraft and missile section of **Control Engineering Co.**, Detroit, subsidiary of Jervis B. Webb Co. The new section will handle precision test equipment for the aircraft and guided missile industries, both private and governmental.

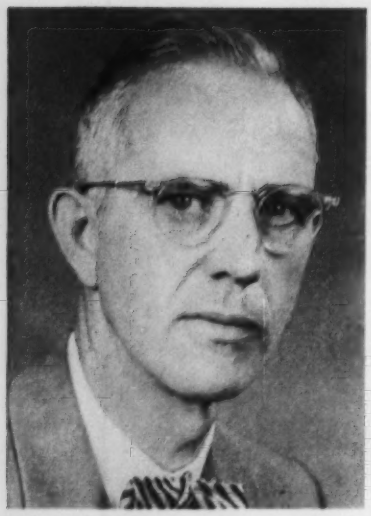
Henry G. Greene was made purchasing agent, **Continental Gin Co.**, Birmingham. He succeeds **Henry F. Davis**, who continues with the department as a consultant.

Joseph M. Safie was elected president and chairman, **Reliance Mfg. Co.**, New York. **Elias Safie** was named to the new post of executive vice president.

Donald C. Morgan, Chicago district sales manager of **Rockwell Mfg. Co.'s** meter and valve division, was named central regional sales manager with offices at Pittsburgh. He is succeeded at Chicago by **R. V. Burnette**. Mr. Morgan replaces **Carl C. Moore**, retired.

Henry B. Williams was made sales manager for the New York plant of **Joseph T. Ryerson & Son Inc.**, 203 Westside Ave., Jersey City, N. J. **William K. Underhill**, assistant manager who formerly was responsible for sales management, will devote his time to other executive duties.

SKF Industries Inc., Philadelphia,



KENNETH W. McKENZIE
. . . Industrial Tectonics sales mgr.

DON L. HINMON
. . . heads new Johns-Manville div.

T. TRINER JANSEY
. . . Triner Scale & Mfg. exec. v. p.

appointed **F. H. Williams** manager of its railway department.

Industrial Tectonics Inc., Ann Arbor, Mich., appointed **Kenneth W. McKenzie** sales manager. Formerly production manager, he succeeds **Helmut F. Stern**, who now devotes himself exclusively to duties of general manager. **Gerald L. Buhrman** was made plant manager in charge of all manufacturing operations.

William A. Mann of Chicago was elected a commercial vice president of **General Electric Co.** He has been assigned as resident officer to the new regional headquarters in St. Louis.

J. A. Lindberg was named regional sales manager, brass products, in the northern Ohio-Michigan region for the metals division of **Olin Mathieson Chemical Corp.** He is at Detroit. **Peter L. Brett** was assigned to the Detroit district as sales representative for the division.

William H. Lang was made assistant vice president, **United States Steel Corp.**, New York. He continues as assistant treasurer of the corporation and president, United States Steel Homes Credit Corp.

Jones & Laughlin Steel Corp., Pittsburgh, promoted **W. F. Gaspar** to resident engineer, Minnesota ore division, and **R. W. Maki** to resident engineer, Michigan ore division.

The industrial products division of **Johns-Manville Corp.**, New York, was divided into three operating divisions. **Don L. Hinmon** is general manager, industrial insulations division, and was elected vice president of Johns-Manville Sales Corp. Other managers are: **Francis J. Wakem**, packings and friction materials division; **Robert F. Orth**, pipe division. Named to Mr. Hinmon's staff are **Thomas H. Eaton**, production manager (also elected vice president of Johns-Manville Products Corp.); **J. B. Jobe**, merchandise manager; and **Edward D. Flavin**, general sales manager. Both also were elected vice presidents of Johns-Manville Sales Corp.

R. A. McCarroll was made manager of industrial engineering at the new engine plant of **Plymouth Division**, Chrysler Corp., Detroit.

F. E. Bickel was made general manager-sales for **Van Huffel Tube Corp.**, Warren, O.

W. Lunsford Long was elected president of three companies — **Haile Mines Inc.**, **Tungsten Mining Corp.** and **Manganese Inc.**, New York. He succeeds the late **Hewitt S. West.**

Charles F. Schultz was made chief industrial engineer, Franklin Division, **Joy Mfg. Co.**, Franklin, Pa.

C. T. Erickson was made executive vice president of **Stillman Rubber Co.**, Culver City, Calif.

T. Triner Jansey was elected executive vice president, **Triner Scale & Mfg. Co.**, Chicago. He was administrative assistant to the president of Borg-Warner Corp.

Kinney Mfg. Division, Boston, New York Air Brake Co., appointed **W. H. Crowley** chief engineer and **J. Raymond Marshall** equipment sales engineer.

Dr. Paul W. Bachman was elected vice president and director of research and development for **Koppers Co. Inc.**, Pittsburgh.

Clifford A. Hampel, consulting chemical engineer, joined **Fansteel Metallurgical Corp.**, North Chicago, Ill., as manager, chemical equipment division.

V. L. Spinney succeeds **R. L. Halsted** as manager of the central region at Cleveland for **Allis-Chalmers Mfg. Co.** Mr. Halsted is now manager of the firm's processing machinery department. **N. W. Landis** replaces Mr. Spinney as New York district manager. **A. J. Mestier Jr.** succeeds Mr. Landis as manager at Detroit.

Raymond J. Dunn Jr. joined **Machinery Engineering & Sales Co.**, manufacturers' representatives, as vice president. He will represent the company in New England from its Hartford, Conn., and Providence, R. I., offices. He was a sales engineer for Hartford Special Machinery Corp. and continues

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Buhr ECONOMATION

Drills, chamfers, spot-faces and individual-lead-screw taps 377 master-brake cylinders an hour gross....

and features electronic mechanism for checking broken drills!

This 7-way dial-type hydraulic-feed Buhr Special has a 48"-diameter 7-position power-operated index table, complete with shot bolt. Two parts are loaded per station in each of its seven fixtures. Automatic clamping of fixtures is performed by a power-wrench with torque control.

Electronic mechanism automatically checks two .028 drills. Following each cycle, drill-checking arms swing sensing probes to and from drills. If either drill is broken, special electronic sensing-circuit stops machine and flashes failure-light.

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HIGH PRODUCTION MACHINERY

Find out how Buhr Economation can reduce your production costs. Phone, wire or write us. A consultation with one of our top sales executives will be arranged promptly!

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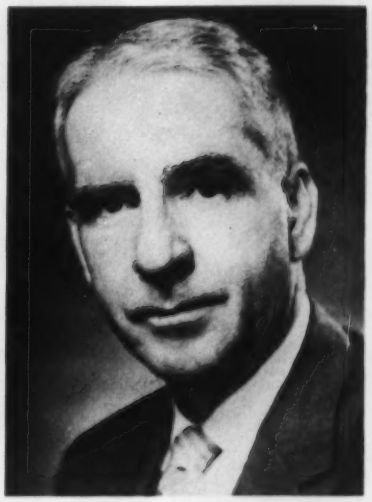
Solidly Engineered • Precision Built • for World's Leading Manufacturers

G. LAWTON JOHNSON
. . . president of Greer Marine Corp.

RALPH W. UPDEGRAFF
. . . chief industrial eng. at Timken



R. ADM. HARRY B. TEMPLE
. . . joins Robertshaw-Fulton Controls

to represent that firm in his new capacity.

G. Lawton Johnson was elected president of **Greer Marine Corp.**, subsidiary of Greer Hydraulics Inc., Jamaica, N. Y. **Edward M. Greer**, president of Greer Hydraulics, was elected chairman of the subsidiary. Mr. Johnson, vice president of Greer Hydraulics, continues in that capacity.

C. L. Whittaker was made district manager of **International Harvester Co.** at New Orleans and **J. W. Morris** assistant district manager at Birmingham.

Ralph W. Updegraff, chief industrial engineer, bearing division, **Timken Roller Bearing Co.**, Canton, O., was promoted to chief industrial engineer of the company. **Ross Russell**, senior industrial engineer in the bearing division, was promoted to divisional industrial engineer for the steel and tube division. **Clyde L. Van Horn** was made chief cost accountant to succeed **R. D. Sager**, retired.

William Spangler heads the new Kansas City sales office of **Resistoflex Corp.** **M. H. Eberle** is sales engineer at Chicago.

R. Adm. Harry B. Temple, USN, ret., was named assistant vice president of **Robertshaw-Fulton Controls Co.** He will be in Washington. His primary duties: Research and development and mechanisms, actuators and instruments manufactured by the Aeronautical Division, Anaheim, Calif. He also will be concerned with the company's expanding interests in atomic energy.

Edward J. Holzman, industrial sales manager, was elected a vice president of **Beals, McCarthy & Rogers Inc.**, Buffalo.

OBITUARIES . . .

Henry E. Warren Jr., 43, assistant general superintendent, **Fairless Works**, United States Steel Corp., Morrisville, Pa., died Sept. 16.

William H. Brink, 54, vice president, **Norwich Machine & Tool Corp.**, Milwaukee, died Sept. 15.

Fred M. Wyman, 65, assistant sales manager, **National Cylinder Gas Co.**, Chicago, died Sept. 18.

William F. Jennings, 69, president and treasurer, **Bound Brook Oilless Bearing Co.**, Bound Brook, N. J., died Sept. 14.

Carl G. Hoff, president, **Hoff Mfg. Co.**, New Haven, Conn., died Sept. 10.

John Hulst, 83, a former vice president of **United States Steel Corp.**, New York, died Sept. 15.

Adam Ross II, 91, president, **Ross Valve Mfg. Co.**, Troy, N. Y., died Sept. 11.

J. Ledlie Miller, 60, assistant chief combustion engineer, **Republic Steel Corp.**, Cleveland, died Sept. 21.

Raymond G. Fralick, 58, owner of **Len-Ray Machinery Co.** and president of **Ralco Tool Corp.**, both of Buffalo, died Sept. 12.

John B. Pottinger Jr., 53, assistant superintendent of control and copper production at Buffalo for **Westinghouse Electric Corp.**, died Sept. 19.

Bryan W. Conklin, 55, president and part owner of **Conklin Forging Co.**, Detroit, died Sept. 18.

Albert O. Wilson, 67, president, **A. O. Wilson Structural Co.**, Cambridge, Mass., died Sept. 19.

John P. Allen, 60, manager of marketing research in the apparatus sales organization of **General Electric Co.'s** lamp division, Cleveland, died Sept. 14.

Allyn G. Mould, 60, director of purchases for **Cleveland Graphite Bronze Co.**, Cleveland, died Sept. 19.

Andrew C. Denison, 67, chairman of the board of directors of **Fulton Foundry & Machine Co.**, Cleveland, died Sept. 20.

BUILDS EXTRA SELLING POWER INTO YOUR PRODUCTS

HOT
. . . rolled strip steel . . .
COLD

TO ORDER

Made and delivered as specified —ready to meet your toughest demands—hallmarks of ALAN WOOD strip steel.

Produced by modern, up-to-date, continuous mills under the most rigid metallurgical control, ALAN WOOD strip possesses the "custom-produced" requirements of a superior product . . . qualities that build extra selling power and repeat sales into your products.

If you require hot or cold rolled sheet or strip steel . . . choose a specialist who understands your production problems . . . and delivers according to your specifications.

IRON PRODUCTS
"Swede" *pig iron*
STEEL PRODUCTS
Plates (sheared)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip
ROLLED STEEL FLOOR PLATE
A.W. ALGRIP *abrasive*
A.W. SUPER-DIAMOND *pattern*
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Now...TAKE AC POWER ANYWHERE A VEHICLE CAN GO!

MO-BIL-AC* (mobile a-c power supply) driven by vehicle engine, supplies up to 10 KW at 110-220 volts . . . . takes little space

Designed by Star-Kimble to meet the need for a compact, portable source of AC at commercial voltage and frequency, MO-BIL-AC drives a-c powered tools, pumps, compressors, hoists and similar equipment in the field . . . *wherever a self-propelled vehicle can go.*

An outstanding feature of MO-BIL-AC is its low size-weight to power output ratio. To achieve it, a 2-pole alternator is excited by a compact, lightweight regulator with a selenium rectifier and magnetic amplifier working off the alternator output.

This unique S-K development also insures excellent transient response: upon application of full load, voltage recovers in one second or less. Speed of prime mover is not critical because regulator keeps output voltage proportional to output frequency. Thus, standard motors may be operated over a wide frequency range without overheating.

MO-BIL-AC is available in 3, 5 and 10 KW ratings, 60 cps, single and polyphase, any commercial voltage.

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More Refractories

Harbison-Walker opens plant at Leslie, Md., to meet growing demand from steel industry

REFRACTORY producers are sharply increasing plant capacity to keep pace with expansion in the steel and other refractory-consuming industries. Physical properties have been enlarged. Operating techniques and machine design have been improved.

Harbison-Walker Refractories Co., Pittsburgh, one of the leading producers, has opened a plant for the manufacture of silica refractories at Leslie, Md. This is part of a $35-million expansion program started in 1951.

New Plants—This program included construction of: A silica refractories plant at Windham, O., and another at Fairfield, Ala.; a fireclay brick plant at Fulton, Mo.; and a basic brick plant at Marelan, Que. Other silica and fireclay brick plants were modernized and substantially enlarged. Capacities have been greatly increased at plants in Baltimore and Warm Springs, Calif., to produce basic refractories — magnesite, chrome and forsterite.

In 1954, the company purchased a large deposit of fireclay near Ohiopyle, Pa., and a plant at Grantsville, Md., for the production of fireclay refractories. Construction of a plant for the manufacture of silica refractories at Leslie was begun in 1954 and completed early this year. Harbison-Walker is operating 29 continuous tunnel kilns and is constructing an additional kiln at Marelan, Que. It had 18 kilns in June, 1951.

Two types of silica refractories are made at the Leslie plant: Star brand, conventional class; and Vega brand, superduty class. These products are used in by-product coke ovens, open-hearth and electric steel furnaces, glass tanks and furnaces of many kinds employed in the refining of copper and other nonferrous metals.

The latest operating techniques and laboratory developments are incorporated into the operation without losing the advantages of latest improvements in machine design. The mechanical and electrical controls in every stage of manufacture are simple and safe.

Progress Through Engineering

Ferro Corp., Cleveland, has a new continuous furnace for porcelain enameling steel and aluminum in the laboratory. The electric unit is 3 x 27 ft. It has preheat and cooling zones, simulating production continuous furnaces. Steel and aluminum porcelain enamels can be fired by using a separate heating unit for aluminum, which takes a lower fusing temperature. Ferro devotes 1 sq ft of floor space to research, development and engineering to every 5 sq ft of manufacturing space.

Baltimore Firm Opens Branches

Allied Research Products Inc., Baltimore, maker of plating chemicals and chromate conversion coatings for nonferrous metals, established warehouses in Cleveland, Detroit and Chicago.

Crane Packing Erects Buildings

Crane Packing Co., Chicago, is erecting two buildings on the outskirts of Morton Grove, Ill. They will house offices and extensive research and laboratory operations. The company produces mechanical seals, mechanical packings, lapping machines, pipe joint and thread compounds. A 126,000-sq-ft factory building is in operation at the site. The project will be completed early next year.

W. W. Sly Opens Branch Office

W. W. Sly Mfg. Co., Cleveland, opened a branch at 292 Worthington St., Springfield, Mass. Joseph Sharkey is district sales engineer for Sly's line of dust control systems, blast cleaning equipment, tumbling mills and industrial ovens.

Ritepoint Acquires New Product

Ritepoint Inc., Milwaukee, has taken over the cartridge case operation of the Nesco Division (that city), New York Shipbuilding Corp., Camden, N. J.

Armco Drainage Opens Plant

Production of corrugated metal pipe at the Charny, Que., plant of Armco Drainage & Metal Products Inc., subsidiary of Armco Steel Corp., Middletown, O., is beginning this month. Armco Drainage has more than 50 plants in operation in the U. S. and Canada, including a newly constructed one at Bishop's Falls, N. F. E. L. Campbell is vice president and manager of Armco Drainage & Metal Products of Canada Ltd., with headquarters at Guelph, Ont. Charles LaRose is superintendent of the Charny plant.

Ward Enlarges Warehouse

Ward Steel Co., Cambridge, Mass., has completed construction of two additional 40-ft bays at its warehouse in that city, increasing operating space one-third.

Federal Tool & Mfg. Expands

Federal Tool & Mfg. Co., Minneapolis, is building a 9000-sq-ft addition to its plant. It will house new equipment, including a 400-ton press, which will process stampings up to ½-in. thickness. Other equipment in the plant will be rearranged for greater operating efficiency. Federal Tool, producer of short-run stampings, has a branch plant in Rochester, N. Y.

Aro Equipment Buys Ampatco

Aro Equipment Corp., Bryan, O., purchased Ampatco Laboratories Corp., maker of precision instrument products. Aro makes highly specialized aircraft products, pneumatic tools and lubricating equipment. Ampatco, operating as a separate corporation in Aro's Cleveland plant, will make electromechanical devices and do development work on them.

Ammonia Plant Plans Progress

This fall heavy construction is expected to start on the anhydrous ammonia plant at the Geneva (Utah) Works of U. S. Steel Corp.'s Columbia-Geneva Steel Division. The Chemical Plants Division of Blaw-Knox Co., Pittsburgh, will build the plant. This

will be the first installation in a major steel plant in the U. S. using raw coke oven gas as the source of hydrogen for ammonia synthesis. It is expected to start a new trend in coal chemicals recovery.

Armco To Buy Equipment

Armco Steel Corp., Middletown, O., will convert the recently purchased Middletown facilities of Warren Steel Corp. into a pipe coating plant. About $360,000 will be spent to move the company's present pipe coating operation to the new plant and to install necessary equipment and facilities. New machinery for coating pipe with coal tar enamel will include abrasive cleaning equipment, a unit to line the inside of the pipe and a wrapping machine which coats the outside of the pipe and wraps it with a protective material. The plant will be equipped with a fume removal system.

Opens Research Laboratory

Alloy Rods Co., York, Pa., electrode manufacturing concern, opened its new research and development center in that city. Facilities include chemical, physical testing and welding laboratories, a machine shop and an experimental mixing and extrusion department.

Hoe Buys Plant in South

R. Hoe & Co. Inc., Bronx, New York, purchased the plant of Carolina Saw & Tool Co., manufacturer of carbide tip saws, at High Point, N. C. The property will be known as the Carbide Saw & Tool Division and will be the nucleus of a greatly expanded operation to include new building facilities and extensive new equipment.

Gearmaker Opens Branch

Philadelphia Gear Works Inc., Philadelphia, opened a district sales office at 1529 Pentridge Rd., Baltimore 12, Md. The office, under the direction of J. Frank Ottinger, will provide direct factory contact for the firm's gears, gear reducers, couplings, fluid agitators and valve controls.

Borg-Warner Broadens Research

Borg-Warner Corp., Chicago, is constructing a multimillion dollar research center at Algonquin and Wolf roads, Des Plaines, Ill. The laboratory will contain facilities for metallurgical, electronic, electrical, chemical, acoustical, hydraulic, applied mechanical, physics and nuclear research. It will house a complete machine and model shop, a computation center and a large technical reference library.

Milne Opens Branch Office

A. Milne & Co., New York, distributor of solid and hollow tool steels, opened a sales office at 14402 Bayshore Dr., Madeira Beach 8, Fla. The office is under the direction of Carl Buehler.

ASSOCIATIONS

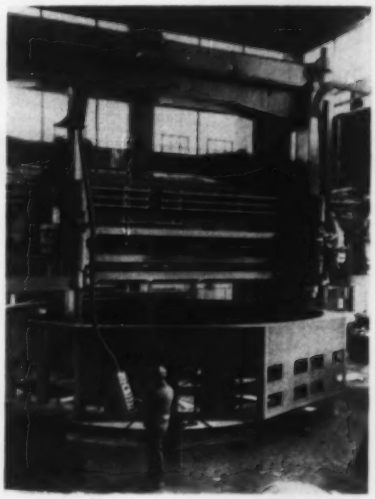
American Die Casting Institute, New York, re-elected its officers for the 1956 term. They are: President, W. J. During, president, Precision Castings Co., Syracuse, N. Y.; vice president, George Ralls, president, Pressure Castings Inc., Cleveland; David Laine, secretary; and W. J. Parker, treasurer.

REPRESENTATIVES

Hans C. Bick Inc., Reading, Pa., maker of chemical specialties to the metalworking trades, appointed M. M. Chatfield as sales and technical service representative with headquarters in Philadelphia.

Automatic Transportation Co., Chicago, appointed DeShazo & Thomas, Birmingham, as representatives for its equipment, including electric-driven industrial trucks.

Koehring Co., Milwaukee, maker of construction equipment, appointed W. B. Thompson as representative in California, Arizona, Utah and Nevada; H. H. Mobley as representative in the East South Central territory. They also represent Koehring Co.'s subsidiaries: C. S. Johnson Co., Champaign, Ill.; Kwik-Mix Co., Port Washington, Wis.; Parsons Co., Newton, Iowa.



Installs Big Boring Mill

This 20,000-kva generator stator frame is being set up for finish machining in Elliott Co.'s new 30-ft Niles vertical boring mill built by Baldwin-Lima-Hamilton Corp., Hamilton, O. The enlarged machining facilities at Elliott's Jeannette, Pa., plant will be made available for outside contracts

Westinghouse Electric Corp., Pittsburgh, appointed Claud S. Gordon Co., Chicago, as distributor of its standard industrial furnaces and related equipment.

Rivett Lathe & Grinder Inc., Boston, appointed Schroeder Bros., Pittsburgh, as representative for its line of air and hydraulic valves and cylinders and power units.

Robert J. Hostetter was appointed sales representative in Seattle for **Aero-Pneumatics Division of Pacific Airmotive Corp.,** Burbank, Calif.

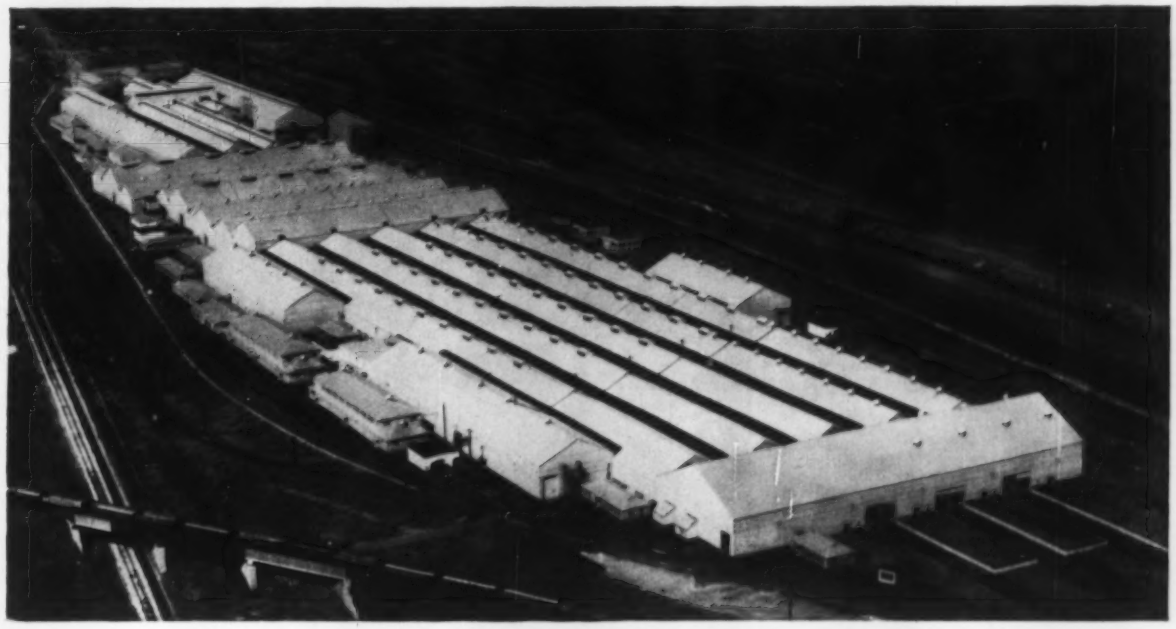
Salem-Brosius Inc., Carnegie, Pa., maker of industrial furnaces and heat-treating equipment, was appointed exclusive agent for the sale and licensing of a new, ultra-high temperature furnace and the processes of **Metals Chlorides Corp.,** Middleport, N. Y. The newly developed processes may provide a major industrial tool to extend across a broad range of metal technology, says W. A. Wickwire Jr., president of Salem-Brosius.

General Services Administration, for the first time, offers FOR SALE...

Choice Industrial Site in Gary, Indiana

(Known as the Gary Armor Plate Plant)

LAND, BUILDINGS, MACHINERY ARE ALL TO BE SOLD!



Grow with the Booming Chicago Area

You've seen the big, and getting bigger, Chicago Area written up in national magazines... you know the rich potential, the skilled labor supply and the abundance of necessary resources this district holds. Now, here is your chance to make the move to capitalize on these big advantages.

Sixty-four buildings with approximately 1,200,000 sq. ft. of floor space are available on this site for steel production, automotive or truck assembly, railroad repair shop, metal fabricating shop, warehouse or distribution center or many other profitable uses.

Look into this golden opportunity to acquire the space and facilities you need in the area that's unmatched for dynamic enterprise. Send the coupon below now for complete details on this plant and site.

For the required Bid Form G-IND-415 and further information send the coupon today to:

GENERAL SERVICES ADMINISTRATION

U. S. Courthouse, Room 575, Chicago 4, Illinois

GENERAL DATA—Sixty-four buildings with well equipped rolling mill, heat treating department, and finishing shop. All utilities available. New York Central and Elgin, Joliet & Eastern Railroads serve the site. Many arterial highways nearby. Original acquisiton cost totals approximately $20,000,000. About 53 acres of land fee owned, approximately 9 acres under lease from New York Central R.R.

This property has been screened against the known defense and other requirements of the Federal Government.

This advertisement is not a basis for negotiation and General Services administration reserves the right to accept or reject any or all offers.

Sealed Bids will be opened 2 P.M. CST Nov. 22, 1955.

General Services Administration, Room 575
U. S. Courthouse, Chicago 4, Illinois

Send complete details and specifications of plant and site offered at once. (G-IND-415)

*Name*_____

*Firm*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

TECHNICALC

For the service you need!

Call Rotary!

Inventory of stainless steel bars within size ranges as indicated are available for immediate delivery!

Long experience in the production of stainless steel plus specialized small-heat procedures make Rotary your best source of supply. Close control of quality goes hand in hand with better service for you at Rotary Electric Steel!

HEXES 1/2"—2"

BAR FLATS ON APPLI-CATION

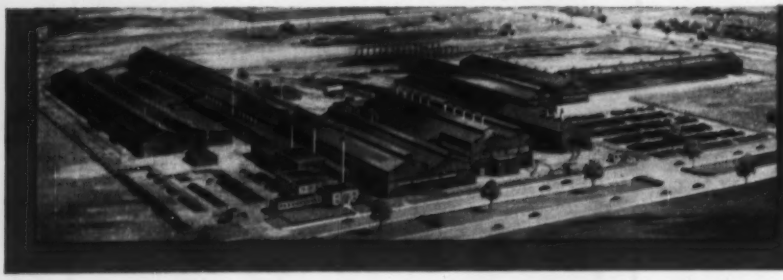
ROUNDS 1/4"—4-1/4"

Hot Rolled - Cold Finished **QUALITY STAINLESS STEEL BARS**

STAINLESS BILLETS FOR FORGING IN COMPLETE SIZE RANGES

Rotary Electric Steel Co.

P. O. BOX 4606 • DETROIT 34, MICHIGAN



ALLOY and STAINLESS STEELS
BILLETS • SLABS
HOT ROLLED and COLD FINISHED BARS

SALES OFFICES—Chicago • Cleveland • Newark, N. J. • Hartford, Conn.

SALES AGENTS—Indianapolis • Fayetteville, N. Y. • Houston, Texas

Technical Outlook

ADDED STRENGTH— Smooth sheet titanium has been replaced by rigidized material to make an engine shroud lighter, stronger and more rigid at Convair. At the forming mill, an all-over pattern of ridges and dimples is rolled into the material. "Even though the new material is thinner than the sheet titanium we were using, it is stronger because of the pattern rolled into it," reports A. P. Higgins, works manager.

NEW APPROACH— Rule - of - thumb methods for determining if a lubricating grease will work with a certain gun can go by the board now. After studying the problem for several years, the National Lubricating Grease Institute came up with its Tentative Dispensing Method. The user of grease gets his answer by obtaining the apparent-viscosity, shear-rate curves of the grease from his supplier and relates it to flow-rate, apparent-viscosity curve which he secures from the maker of the grease gun. Then he can determine the temperature at which the needed amount of grease will be delivered.

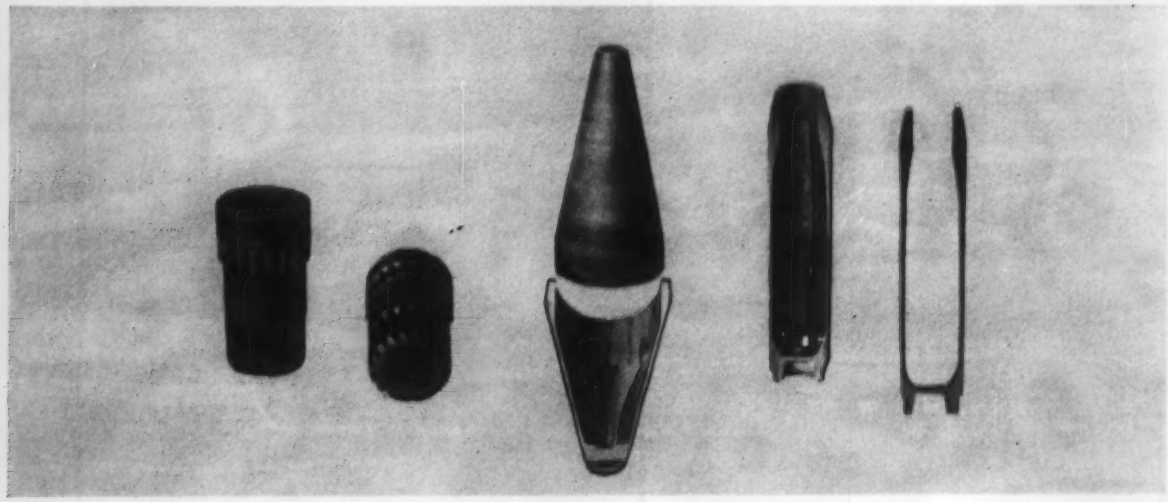
CONTINUOUS MOLDING— Miles-long rubber parts are being made by continuous molding, a process said to be cheaper, faster and as accurate as press molding and more exact than extruding. It can use softer rubber stocks. Users can cut to the length needed, eliminating practically all scrap.

PROTECTS AT HIGH TEMPERATURE— Uses for molybdenum, the king of high temperature metals (melting point, 4730°F, almost 2000°F above iron) are limited because it oxidizes rapidly at elevated temperatures. Much work is being done to find coatings that will protect its surface. Climax Molybdenum Co. says it has developed a metallic coating over which aluminum oxide is applied before sintering. Coated molybdenum parts will stand repeated heating and cooling for at least 500 cycles (1-in. test strips are heated to 1800°F in 30 seconds, held for 15 seconds, then cooled to room temperature in 45 seconds). The new coating is the only one Climax metallurgists have found that will stand the 500-cycle test consistently. The coating and test equipment will be exhibited in the Climax booth at the Metal Show in Philadelphia during the week of Oct. 17.

COUNTERACT— Westinghouse scientists are not satisfied with the corrosion resistance of double-purified zirconium. They have found that tin will counteract the harmful effect of impurities and not absorb many neutrons. Their new super-corrosion-resistant zirconium alloy contains 1.5 per cent tin, 0.12 iron, 0.10 chromium and 0.05 nickel.

DIECASTING STANDARDS— Five new product standards in the engineering series of the American Die Casting Institute have been issued. They cover: 1. Depth of cored holes. 2. Draft requirements for cored holes. 3. Ejector pin marks. 4. Machining stock allowances. 5. Flash removal. ADCI believes that a standard should describe the most economic and useful specification for diecastings when special requirements are not asked for.

MORE COPPER— Look for cheaper brass diecasting production within the next few years. The American Die Casting Institute says research on dies for higher melting point metals, such as copper-base alloys, shows encouraging progress. Improved die lubricants are being field tested.



Parts like these are convincing proof that . . .

Cold Extrusion Is Shaping Up

By JOHN E. KING
Cold Forming Division
Heintz Mfg. Co.
Philadelphia

MENTION COLD EXTRUSION to someone not versed in its application and out come the inevitable questions: "When do you use it and why?" Broadly, the answers are in the description of the two basic types of extrusion.

Backward extrusion may be used to make cup-shaped pieces that are not customarily formed without heat. A billet of bar stock can be formed to hollow shapes with marked savings in material, tolerances are closer than other methods allow and finishes are excellent.

Forward extrusion can save on drawing operations. It is possible to get substantially greater reductions by combining two or more draws into a single extrusion.

Improvement in physicals of low alloy steels is inherent in the process. Frequently, more expensive steels and heat treatment can be by-passed.

Best Applications—Briefly, they are:

1. A shape (generally cylindrical, either solid or tubular) which can have large variations in wall section—and, if tubular, with an opening so tools may be withdrawn. Heavy cold nosing in a single step is easy, however. Practical limits in a single forward extrusion may be a reduction in area of over 75 per cent. The same reduction is possible in a single backward extrusion, provided the ratio of the diameter of the cavity to its depth is not over 1 to 4.
2. The job should have a strength requirement ordinarily obtainable by heat treating medium carbon or low alloy steels.
3. There should be sufficient job quantity to warrant the costs of tooling and press setup.
4. You should be able to use the parts as they come off the press with minimum finishing or machining. Fine surface finish is something you get free—it comes from tools that must be polished in the neighborhood of 20 microinches.

Big Potential — When a piece meets the above description—and it fits a large number made by other methods—it is possible to reduce manufacturing operations significantly by cold extrusion.

Expensive hot forging and machining for dimensions may be eliminated. Savings in raw material, manpower, time and equipment may prove substantial. The best applications will be those in which cold extrusion was incorporated at the design stage.

Artillery Shells—Some idea of the extraordinary savings in material is evident from these data: A 75-mm shell weighing 8.9 lb is formed from a billet weighing 9.22 lb, a loss factor of 3.4 per cent; a 120-mm shell weighing 42.13 lb, from a 43.3-lb billet; a 155-mm shell weighing 76.25 lb, from a 78-lb billet; and an ogive for a 106-mm shell weighing 3.6 lb, from a 4.25-lb billet.

Labor savings: Machining operations on each shell were trimmed from 29 to 5. Material savings: Since cold shaping greatly enhances physical properties, specifications were met with low carbon steel. Eliminated was the need for final heat treatment, which is required when hot forging is used.

Press Life—Compared with that

Average Physical Properties of Steels for Cold Shaping

	ANNEALED			AFTER EXTRUSION				
Type	Ultimate Strength psi	Yield Strength psi	% Elong. in 2" Gage Length	Ultimate Strength psi	Yield Strength psi	% Elong. in 2" Gage Length	% Increase in Yield Strength	% Decrease in Elongation
1010	51,000	24,000	40	118,500	117,400	13.5	390	66
1018	60,100	28,850	39	146,000	133,500	12.0	364	69
1030**	67,250	49,500	31	166,000	161,000	9.0	225	71
1035**	84,000	50,000	30	164,000	160,500	5.5	220	82
4130	81,250	52,250	28	166,500	139,000	14.5	166	48
4140	95,000	60,400	26	178,500	159,000	12.0	163	54
5130	89,000	55,000	28	157,000	115,500	12.0	110	57
6120**	75,000	55,000	32	144,000	115,000	14.0	110	57
8620	77,750	55,875	31	144,350	125,650	14.0	124	55
8630	81,750	54,000	29	171,000	166,350	12.0	206	58.5
8730	98,000	65,000	25	154,000	145,000	17.5	123	30
*NAX 9115**	70,000	50,000	35	167,000	163,500	9.0	227	74

*Steel mill designation **As received hot rolled bar

of conventional hot forging dies and punches, the longevity of cold press tools is almost unbelievable. In our most severe backward extrusion operation, to date we have exceeded 480,000 pieces without measurable wear on a carbide punch.

Die rings don't stand up too well, but we've developed and patented a means of quick interchangeability of such inexpensive wearing members so that almost the same economic status is achieved.

Of course, we use wear resistant carbide materials where function and quantity permit. On die bushings we use oil hardening tool steels.

Selecting Raw Materials — For many years we have been developing items using other than low carbon steel, namely the AISI 6100, 4000, 4100, 5100, 8600, 8700 and higher carbon steels. Latest figures on properties reveal some exceptionally high strengths without heat treatment. Typical physicals of materials (after, say, six press operations) are compared with those of annealed materials in the table above.

The primary aim in testing was to obtain highest strength properties without tool failure. Current data were taken from tests on a hollow body formed by both backward and forward extrusion.

The greatest percentage increase in yield strength through cold shaping was in the carbon steels. Of the low alloys, 5130 exhibited best enhancement of yield strength. Conversely, elongation was decreased accordingly as the yield strength increased. However, good ductility remained.

Tool Engineering—Much progress has been made in the last ten years on tool and development engineering. This work is highly complex. With such extreme results gained, extreme measures are the rule, not the exception. Yet our production people don't find our controls too tight.

Experience must supplement development engineering on each new application. Each presents a new problem since the business of moving metal cold in dies is a highly intricate one. Metal must be controlled in flow without being restricted to the point where excessive load buildup causes tool failure. And at the same time, that metal is being formed into accurate dimensions and volumes.

Typical Applications for Cold Forming

Hydraulic cylinder

Old Way—Originally designed and manufactured in three major pieces. Weight of materials at start, 2.75 lb—a tube and two end caps, the latter produced on screw machines. Assembly brazed and machined and the bore honed.

New Way — A 2.2 lb billet of 1015 steel is cold formed in press operations to finished weight of about 2 lb. Tolerance on inside diameter, 0.002 in. Surface finish, 20 rms. Total saving, 30 per cent.

Stainless steel ring

Old Way—Had been made by machining a forging or completely machining a rolled strip.

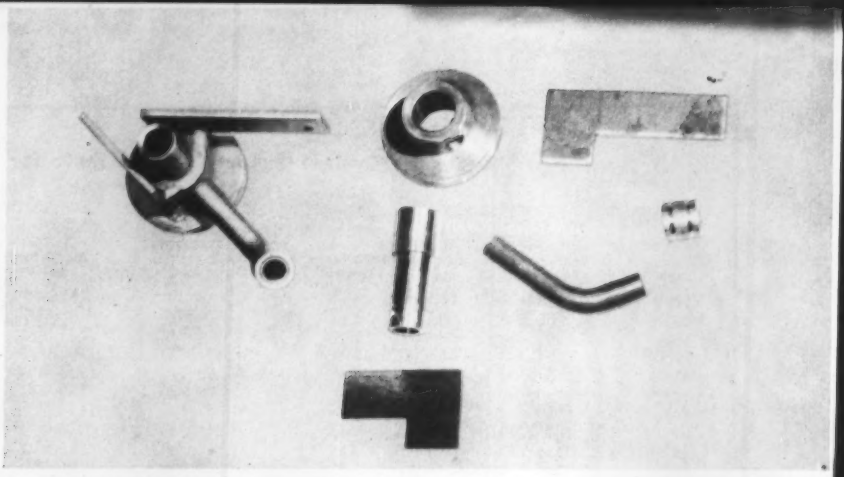
New Way—Strip of 18-8 stainless is formed and welded. Shoulder on one end is forward extruded, then indents and bosses are coined. Total saving, 40 per cent.

Truck differential gear

Old Way—Produced by machining a hot forging in variety of operations.

New Way—Start with 8620 steel billet weighing 7.6 lb. Only machining required on pressed part is facing of both ends, an undercut for forked groove and a small relief cut. Finished weight is 4.55 lb. Customer saving, 20 per cent.

By WILLIAM W. LAMB
Sales Manager
Precision Metalsmiths Inc.
Cleveland



As originally produced

As precision cast ▶

What Alloy for Investment Casting?

Standard Investment Casting Alloys

	Low Alloy Steels				Austenitic Stainless			Martensitic Stainless		
	4620 Mod	4140 Mod	6150 Mod	52100 Mod	Type 302	Type 316	Type 347	Type 410	Type 420	Type 440-A
Carbon	0.15-0.25	0.35-0.45	0.45-0.55	0.95-1.10	0.08-0.15	0.15 max	0.12 max	0.15 max	0.20-0.40	0.60-0.75
Silicon	1.0 max	1.0 max	1.0 max	0.75 max	1.0 max	0.75 max	1.0 max	1.0 max	1.5 max	1.0 max
Manganese	0.50-0.70	0.50-1.0	0.5-1.0	0.60 max	1.5 max	1.5 max	2.0 max	1.0 max	1.0 max	1.0 max
Sulphur	0.03 max	0.03 max	0.03 max	0.03 max	0.03 max	0.03 max	0.03 max	0.03 max	0.03 max	0.03 max
Phosphorus	0.04 max	0.04 max	0.04 max	0.04 max	0.04 max	0.04 max	0.04 max	0.04 max	0.04 max	0.04 max
Chromium	—	0.80-1.10	0.80-1.10	1.25-1.60	17.0-19.0	16.0-18.0	18.0-19.5	11.5-13.0	11.5-14.0	16.0-18.0
Nickel	1.5-2.0	—	—	—	7.0-10.0	12.0-14.0	10.0-14.0	0.50 max	1.0 max	—
Molybdenum	0.20-0.30	0.15-0.25	—	—	0.5 max	1.5-2.25	0.50 max	0.50 max	0.50 max	0.75 max
Copper	—	—	—	—	0.5 max	0.5 max	0.50 max	0.50 max	0.50 max	—
Iron	bal	bal	bal	bal	bal	bal	bal	bal	bal	bal
Others			V 0.15 min				Cb + Ta 10 x C min 1.5 max			
HEAT TREATED										
Tensile Strength psi	96,000	132,200	115,500	110,000	80,000	81,000	77,500	156,000	100,000	102,300
Yield Strength psi	59,000	117,200	91,400	108,000	40,000	34,800	40,500	143,000	76,000	92,200
% Elongation in 1 in.	14.0	4.5	2.5	1.0	45.0	48.0	44.0	3.5	4.0	2.0
Hardness	Rb 85-95	Rc 28-32	Rc 25-28	Rc 24-27	Rb 84-86	Rb 73-75	Rb 73-75	Rc 32-38	Rc 27-30	Rc 36-40
ANNEALED										
Tensile Strength psi	90,700	117,200	102,000	101,000	75,000	78,000	78,300	100,000	95,000	95,500
Yield Strength psi	41,500	69,200	58,000	68,000	35,000	34,000	28,000	77,000	50,000	65,200
% Elongation in 1 in.	20.0	19.0	16.0	18.0	55.0	44.0	33.0	20.0	15.0	3.0
Hardness	Rb 88-92	Rb 94-99	Rb 90-95	Rb 90-95	Rb 80-83	Rb 76-78	Rb 86-89	Rb 96-100	Rc 18-22	Rc 20-25
AS CAST										
Tensile Strength psi	130,000	155,000	225,000	—	—	—	—	204,000	220,000	—
Yield Strength psi	110,000	142,000	200,000	—	—	—	—	128,000	165,000	—
% Elongation in 1 in.	15.0	9.0	—	—	—	—	—	6.0	1	—
Hardness	Rc 26-30	Rc 33-36	Rc 62 max	Rc 63 max	—	—	—	Rc 40-44	Rc 45-48	Rc 58 max
Castability	Fair	Good	Good	Exc	Exc	Exc	Exc	Poor	Fair	Good
Machinability†	65A	60A	45A	35A	25A	25A	25A	55A	40A	40A
Weldability	Good*	Good*	Good*	Good*	Good*	Good*	Exc	Fair*	Fair*	Fair*
Properties and Uses	High mechanical properties. Structural members, tool holders, farm machinery and automotive parts				Corrosion resistance and resistance to scaling at high temperatures. Aircraft and missiles, dairy and photographic equipment			Hardness and limited corrosion resistance. Cutlery and surgical instruments, petroleum, beverage and steam blow pump parts, valves		

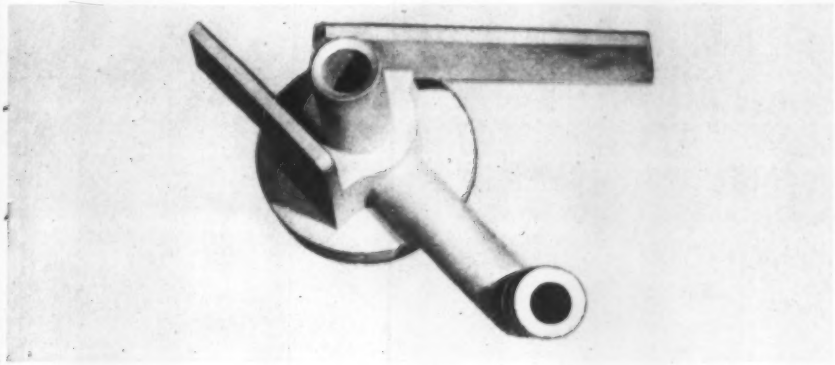
† B-1112 steel equal 100% machinability used as basis for rating A—annealed, AC—as cast * Requires pre and post heat treatment

THIS VALVE once had six parts made of three metals—brass, copper and steel. Now, it's a single investment casting; one material, a beryllium-copper alloy, is used.

Price of the pressure-tight investment casting is $4.90. The assembled part cost about $18.

Investment castings eliminate up to 90 per cent of machining; metal cost is a minor item.

But cost figures point up only one of the advantages of investment castings. Equally important are the design flexibility and the wide selection of alloys. There are over 250 alloys to chose from. Representative alloys and their properties are given in the abridged chart below.



Versatility—The process is used for experimentation and high production.

Two or more pieces of the expendable pattern materials (wax, plastic or frozen mercury) can be joined to form a compound pattern. Result: A cast assembly.

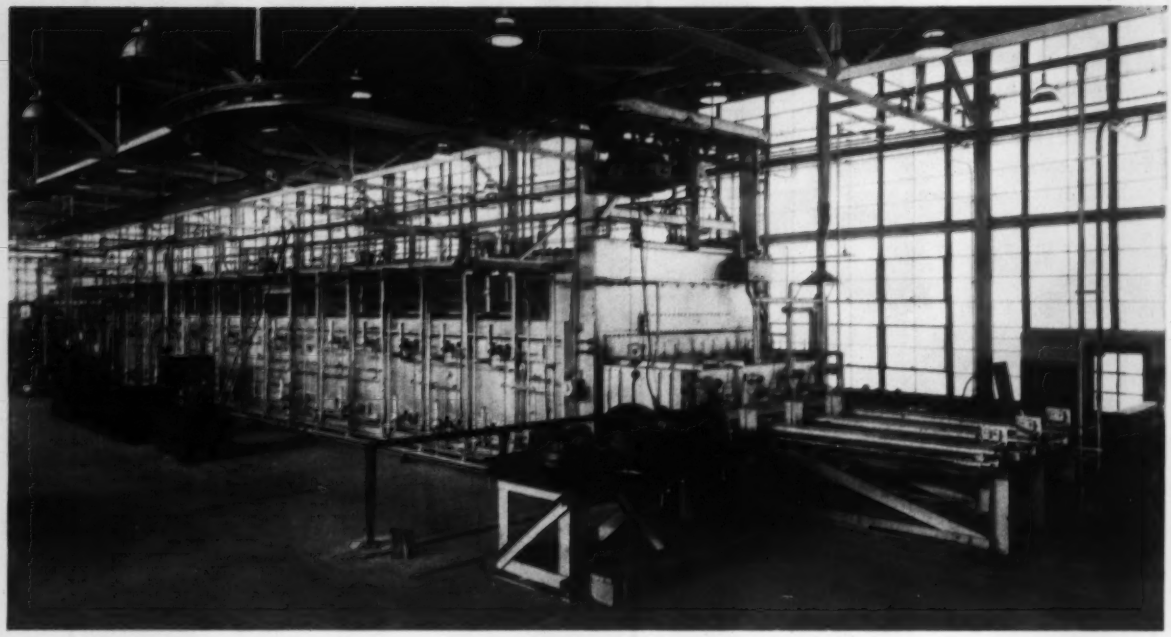
Investment castings usually are small or intricate. In many cases the parts are too expensive or impossible to machine or fabricate.

High standards of tolerance and quality are maintained. Melting is carefully controlled by small arc or induction furnaces.

Unique — Only by investment casting can some nonmachinable, nonforgeable alloys be shaped. Use of expendable patterns eliminates the parting line where accuracy often is lost.

Precip. Hardening	Nickel Alloys			Copper-Base Alloys				Aluminum Alloys			
17-4 PH Alloy	S Monel	Cast Monel	Beryllium Nickel	Beryllium Copper	Silicon Brass	Navy "G" Bronze	Aluminum Nickel Bronze	Type 356	Type 355	40-E	Tern Alloy # 7
0.07 max	0.30 max	0.30 max	0.4 max	—	—	—	—	—	—	—	—
1.0 max	3.5-5.0	1.0-2.0	—	0.20-0.35	3.0-5.0	—	—	6.5-7.5	4.5-5.5	0.25 max	0.2 max
1.0 max	0.50-1.5	0.5-1.5	—	—	—	—	3.5 max	0.3 max	0.5 max	0.30 max	0.4-0.6
0.03 max	0.03 max	0.03 max	—	—	—	—	—	—	—	—	—
0.04 max	0.04 max	0.04 max	—	—	—	0.05 max	—	—	—	—	—
15.5-17.5	—	—	0.80 max	0.005 max	—	—	—	—	—	0.4-0.6	0.2-0.4
3.0-5.0	62.0-68.0	62.0-68.0	bal	—	—	1.0 max	3.0-5.5	—	—	—	0.2 max
—	—	—	—	—	—	—	—	—	—	—	—
3.0-5.0	bal	bal	—	bal	bal	86.0-89.0	78.0 min	0.2 max	1.0-1.5	0.30 max	0.2 max
bal	3.5 max	2.5 max	—	0.25 max	—	0.15 max	3.0-5.0	0.6 max	0.8 max	1.0 max	0.8 max
Cb + Ta	—	—	Be 2.55-2.8	2.5-3.0		—		Mg 0.2-0.4	0.4-0.6	0.5-0.7	1.8-2.4
0.25-0.45	—	—		Al 0.15 max			Al 10.0-11.5	bal	bal	bal	bal
	Pb 0.01 max	0.01 max		Pb 0.02 max	0.5 max	0.30 max		Ti 0.2 max	0.2 max	0.1-0.3	0.2 max
				Zn 0.10 max	12.0-16.0	1.0-3.0		Zn 0.3 max	0.3 max	5.0-6.0	4.0-4.5
				Co 0.30-0.65		Sn 9.0-11.0					
167,000	134,000	65,000	115,000	75,000	60,000	40,000	85,000	22,000	22,000	—	30,000
87,000	121,000	32,500	60,000	40,000	24,000	18,000	40,000	15,000	15,000	—	19,000
1.0	6.0	25.0	7.0	30 max	15	20	10.0	0.7	0.5	—	2.0
Rc 38-41	Rc 33-38	Rb 76	Rc 24-30	Rb 75-90	Rb 56-58	Rb 48-51	Rb 87-90	—	—	—	bhn 65 min
								(—T51)	(—T51)	(—T5)	(#)
159,500	99,300	—	90,000	55,000	—	—	—	25,000	26,000	32,000	36,000
68,700	74,000	—	50,000	30,000	—	—	—	17,000	18,000	22,000	26,000
5.0	16.0	—	8.0	50 max	—	—	—	3.0	1.5	3.0	3.0
Rc 33-36	Rc 24-26	—	Rc 20-25	Rb 60-85	—	—	—	bhn 45-50	bhn 50-55	bhn 65 min	bhn 70-75
								(—T6)	(—T6)		(—T6)
180,000	140,000	—	200,000	175,000	—	—	100,000	32,000	33,000	—	40,000
115,000	126,000	—	190,000	155,000	—	—	55,000	28,500	29,000	—	37,000
3.0	2	—	0-2	1	—	—	5.0	3.0	2.5	—	0.5
Rc 40-45	Rc 42 max	—	Rc 52-56	Rc 40-44	—	—	Rb 93-97	bhn 65 min	bhn 70 min	—	bhn 75-85
Exc	Good	Good	Good	Exc	Exc	Good	Fair	Exc	Exc	Fair	Fair
65A	35A	40AC	55A	20AC	60AC	20AC	20AC	75 (—T6)	75 (—T6)	75 (—T5)	75 (—T6)
Exc	Poor	Poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Good‡	Good‡
Corrosion resistance, hardness. Gears, cams, aircraft controls	Corrosion, heat and wear resistance. Valve and pump parts for food and chemical industry, nongalling valve seats, bushings, turbine parts			Corrosion and wear resistance. Boat and ship hardware, pump and valve parts, electrical applications, oil extracting equipment, parts to be plated				Corrosion resistance at normal temperatures, low weight. Radar wave guides, fuel pump impellers, aircraft structural members, housings and bodies			

21 days at room temperature or 8 hours at 210° F. ‡ brazing



This unit, which does the work of seven bell-type furnaces, points up . . .

New Trend in Wire Annealing

A CONTINUOUS, pusher-type furnace in a Massillon, O., plant could be changing the present concept of wire annealing. This unit is turning out almost as much volume as a battery of seven bell-type furnaces, to say nothing of improving product uniformity.

Some two years ago, a management team from this plant, the Reliance division of Eaton Mfg. Co., sat down with engineers of Surface Combustion Corp., Toledo, O. "Is it possible," they asked, "to take advantage of the high output, flexibility and control accuracy of a continuous furnace?"

No one knew for sure, but that started the wheels turning.

Success—After several months of operation, Eaton has the answer. Depending on the cycle chosen for the material being annealed, the furnace can turn out close to 5000 lb an hour. The clean, decarb-free surface of the coils coming off the exit end proves the effectiveness of the controlled atmosphere.

As to the flexibility of the furnace, the dozen grades of steel treated so far include: 1010, 1017, 1022, 1035, 1060, 1080, 1090, 50100, 51100, 52100, 8630 and 9254. This wire goes into a myriad of snap rings, bearing rings, retainer rings, lock washers and patented fasteners.

The Furnace—Some 135 ft from charging pushers to exit pullers, the installation outwardly resembles a Surface furnace used for malleablizing castings. The furnace proper has five zones, with horizontal rows of radiant tubes above and below the charge. Usually the first two zones are used for heating and soaking, while the following are used for controlled cooling. Between the furnace and the cooling stage is a 7-ft refractory transition zone that is neither heated nor cooled. Next comes the 24 ft 6 in. fast cooling section that is flanked by water tubes.

Entrance and exit vestibules are identical. Each has a car which travels at right angles to the direction of furnace flow, and each car accommodates three 42-in.-square trays capable of holding 1000 lb of wire each. Air-tight doors to the vestibules are integral to the cars.

How It Works—There are 28 strings of trays in the furnace by the time the first string is ready to be pulled out. With the exit vestibule purged and filled with RX gas of the same analysis as the furnace, the furnace door is lifted and the pulling tongs engaged to the three trays. A hydraulic puller moves the wheel-equipped trays into the vestibule and onto the exit car. The furnace door closes and the vestibule car moves over to the unloading area.

While this is taking place, a similar cycle is in progress at the charging end, except in reverse.

The inner furnace door is raised and the charge pushed. This, of course, pushes the entire furnace load ahead one tray length. Three loaded trays are rolled onto the charging car; the car moves into the vestibule; a timed purge and atmosphere balancing of the vestibule follows.

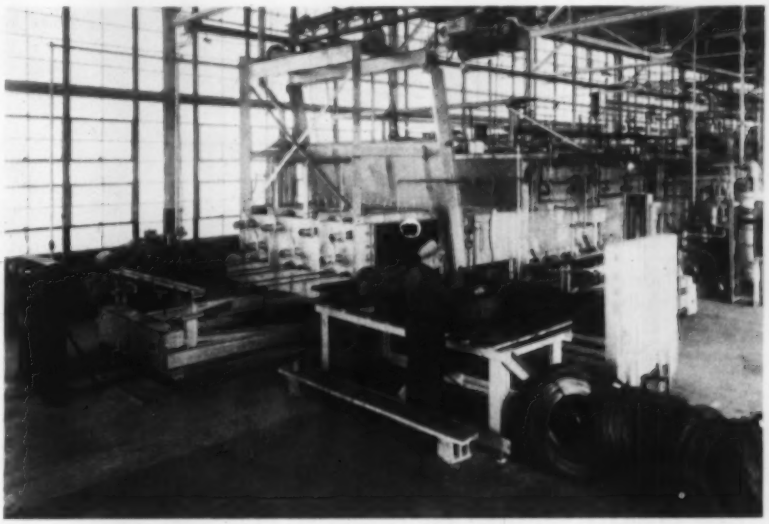
The sequence is interlocked, so that it is impossible to push a charge until the discharge has been completed.

Atmosphere—While the furnace could be used for carbon-correction annealing, Eaton uses a modified RX gas atmosphere that is balanced to maintain the carbon content of the steel. This is done by mixing with the carburizing atmosphere quantities of lean DX generator gas to maintain a definite carbon potential level in the atmosphere. The gas analysis of the atmosphere is 1.8 to 2 per cent CO_2, 16 to 17 per cent CO, 32 per cent H_2, 0.4 per cent CH_4 at a dewpoint of plus 65°F. By altering the dewpoint and the CO_2 content of the atmosphere, the carbon in the steel can be raised or lowered.

Since some of the processes are carried out below 1400°F, the H_2O and CO_2 contents must be increased to be in balance with the carbon in the steel. It is a prime requisite that the material must not be carburized during the annealing process. In this process, the CO_2 content is high enough to be measured accurately by Orsat analysis. This, of course, would not be true at carburizing temperatures, e.g. 1700°F. A CO_2 analyzer-recorder is to be installed soon to give the furnace operator even closer control.

One feature of charging smaller loads into this furnace is the minimizing of atmosphere variation caused by impurities, oxides, moisture and foreign material on the steel. The load being small in comparison with that in a bell-type furnace limits the possibility of seriously affecting the atmosphere gas during the heatup.

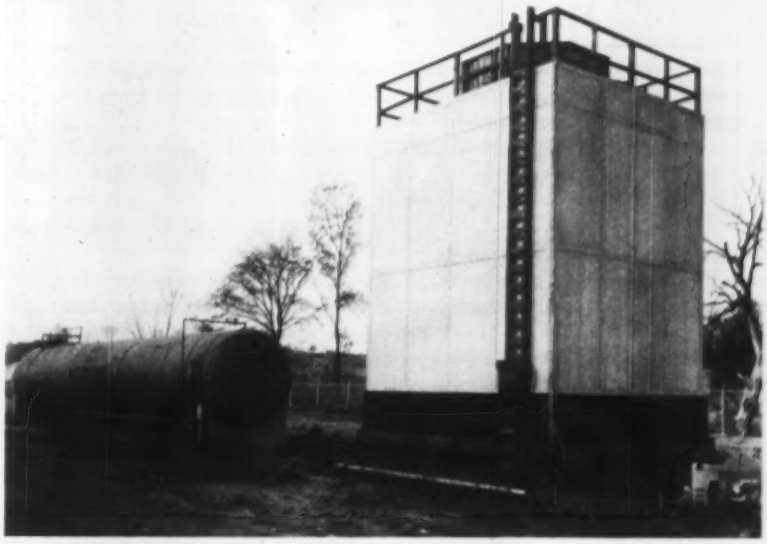
There are seven staggered ceiling fans in the furnace proper and three pairs of fans in the cooling zone. They keep the atmosphere thoroughly homogeneous.



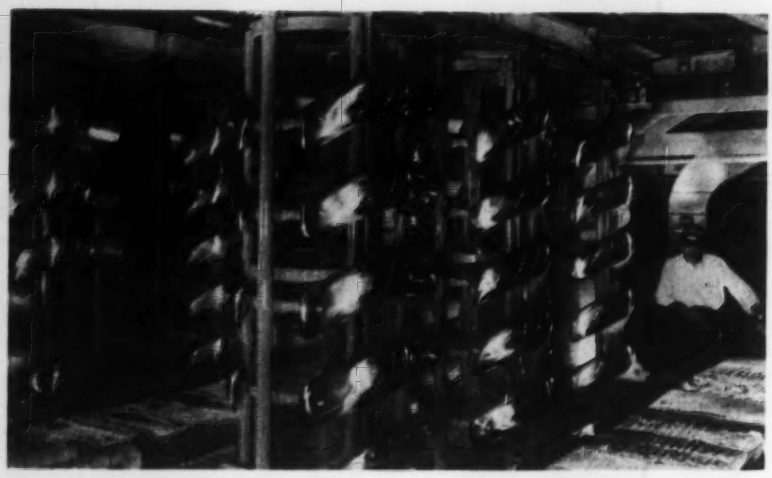
Operator is unloading wire at the discharge end of the furnace. Pull-out mechanism is at left; discharge car is in "out" position

Safety Controls—Although quantities of lean DX generator gas are mixed with RX generator gas, the furnace atmosphere could be explosive when mixed with air. Certain heat treating cycles are required in which the maximum temperature in the furnace is only 1200°F. A power failure at this low temperature normally creates explosive hazards. The equipment at Eaton is so engineered that, if power fails, nonexplosive DX generator gas automatically flows into the furnace chamber. The flow of gas pressurizes the furnace chamber, preventing air from infiltrating as the furnace cools. The DX gas is stored in a 30,000-gal tank under 150 psi pressure.

If the failure affects the RX gas generator alone, the DX generator produces enough gas to pressurize the furnace without using the gas stored in the tank. This type engineered equipment substantially eliminates the explosive hazard of using endothermic atmospheres at temperatures as low as 1200°F.



The pressure storage tank, left, contains DX gas for use in emergencies. Water cooling tower, right, supplies cooling section of furnace



Three of these lines put the gleam on bumpers . . .

One Every 3 Seconds

IF YOU had to plate 19,000 automobile bumpers every two-shift day, it would take quite a plant. Matter of fact, it probably would be the largest plating facility in the world.

Chevrolet engineers believe their new Livonia, Mich., plant qualifies for that title. Consider these statistics:

One finished bumper every 3 seconds.

Plant area the size of three football fields.

Plating and storage tank capacity over 906,000 gal.

Generated power would light 20,000 homes.

Structural steel in machines alone would build a 38-story office building.

Plating solution is filtered at 7000 gpm.

Completely Automated — Naturally, an operation of this magnitude is as completely automated as possible. Because of the part contours involved, there is no horizontal travel in the tanks. Each of the three machines operates on a 57-second immersion, 50-second travel cycle. Each carrier with its load of bumpers weighs about 2400 lb.

Plating times are lengthy, so when carriers reach these stages they leapfrog over earlier carriers that are already being plated and drop into the first vacant cell. At the conclusion of plating time, the carriers again must leapfrog other cells to move into the rinse stage.

Three Levels — The Chevrolet bumper has three sections (a center bar and two end wings) that are bolted together later under the bumper guards. Each carrier is composed of three racks, and each rack was designed to hold 12 end wings or 12 center bars. These are loaded in a station beneath the level of the machine.

Screw-type elevators lift each carrier to a starting position on the line from where it begins the 43-step process. All horizontal movement takes place outside the tanks. After the Perflow nickel plating cycle, the carriers are again dropped to the lower level for buffing.

They return to machine level for cleaning, chrome plating and rinsing, then drop down again to the unloading station. Empty carriers are lifted to a level above the machine where a trolley shuttle whisks them back to the starting end of the line.

Meaker Co., Chicago, supplied the three plating machines. The entire installation was designed and erected by George L. Nankervis Co., Detroit.

Sequence of Operations:

Tank	Operation
1.	Soak Clean
2.	Soak Clean
3.	Spray Rinse
4.	Cathodic Clean
5.	Spray Rinse
6.	Acid Dip
7.	Spray Rinse
8.	Anodic Clean
9.	Spray Rinse
10.	Spray Rinse
11.	Warm Acid Dip
12.	Nickel Strike
13.	Reclaim Rinse
14.	Spray Rinse
15.	Sour Rinse
	57 seconds each tank
16.	Copper Plate (3 cells)
17.	Copper Plate (3 cells)
18.	Copper Plate (3 cells)
19.	Copper Plate (3 cells)
20.	Copper Plate (3 cells)
	27 minutes total
21.	Reclaim Rinse
22.	Spray Rinse
23.	Sour Rinse
	57 seconds each tank
24.	Nickel Plate (3 cells)
25.	Nickel Plate (3 cells)
26.	Nickel Plate (3 cells)
27.	Nickel Plate (3 cells)
	20 minutes total
28.	Reclaim Rinse
29.	Spray Rinse
30.	Hot Rinse
	57 seconds each tank
31.	Soak Clean
32.	Soak Clean
33.	Spray Rinse
34.	Cathodic Clean
35.	Spray Rinse
36.	Acid Dip
37.	Spray Rinse
38.	Spray Rinse
	57 seconds each tank
39.	Chromium Plate (3 cells)
	4 minutes total
40.	Reclaim Rinse
41.	Reclaim Rinse
42.	Spray Rinse
43.	Hot Rinse
	57 seconds each tank

J&L cold drawn ELECTRICWELD tubing now available with a superior SPECIAL SMOOTH I.D. finish

Reduces your over-all production costs in applications like these . . .

- **cylinder tubing**
- **hydraulic and pressure tubing**
- **shock absorbers**
- **ordnance components**

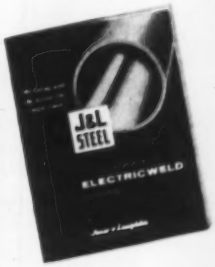
This new drawn-over-mandrel grade tubing with its mirror-like inside surface finish is today busy helping manufacturers reduce or entirely eliminate costly machining on many applications and is being substituted for more costly types of steel tubing. For example, it may be used, without inside honing, for many cylinders through which plungers are passed.

J & L Cold Drawn ELECTRICWELD Tubing with a *Special Smooth* ID finish combines the physical advantages imparted by today's modern electric welding techniques with those of cold working. It withstands high internal hydrostatic pressures, carries heavy torsion loads, resists high-frequency vibration, and offers a favorable weight-to-strength ratio for applications in which loading occurs in all directions.

J & L Cold Drawn ELECTRICWELD Tubing can be furnished in its three specifications in OD sizes from ¾-inch to 2¼ inches and in wall thickness from 20 to 10 gage, 0.035 and 0.134-inch respectively.

This new booklet provides the information you need . . . specifications . . . tolerances . . . chemistry . . . mechanical properties . . . annealing . . . finishes.

J&L STEEL



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New soaking pits go into action at August Thyssen Steelworks in West Germany as war damage is cleared away. Ingots have "passports" which indicate type of steel and profile

German Steel on the Rebound

AS WORKMEN at August Thyssen-Hutte A. G. in Duisburg, Germany, bulldoze bomb rubble and clear foundations, workmen in the plant are making steel.

Before the war, Thyssen had a blast furnace capacity of 1.4 million metric tons of steel ingots. Only one blast furnace was removed in the Allied dismantling program, but the steelmaking department was stripped of seven Thomas converters, seven electric furnaces and 8 out of 12 open hearths. Only one mill stand was left.

Rolling Again—Saved from complete dismantling by the Petersberg agreement of August, 1949, Thyssen was back in operation with one blast furnace by May, 1951. Now it has one of the most modern continuous hot strip mills in Europe, built with the aid of federal and state funds and the technical assistance of the Armco Steel Corp.

The mill has a scale breaker, four roughing stands, and six finishing stands built by Demag, but equipped with Morgan bearings and Bliss downcoilers. Now being readied for operation are a Continental, 4-stand, 4-high, tandem cold mill and a Wean shear line.

Five blast furnaces are turning out 1.3 million tons of iron annually; four Thomas converters and six open hearths produce 1.4 million tons of steel. The strip mill can roll 1.5 million tons, so plans are under way to expand steel capacity to 1.8 million tons

Production Climbs — The pressure is on the entire steel industry to get out more material for Germany's revitalized industry. In 1937, production was 17.5 million. From a postwar low of 4 million tons, production is back this year to 20.5 million. Next year the goal is 22 million; in 1957, 25 million; and in 1965, 28 to 30 million.

West Germany has 55 steel companies, of which 27 are considered leading mills. Seventeen are units of the prewar Vereinigte Stahl-

werke (VST). Under Allied decartelization, combines were broken up. Some, like Thyssen, were separated from their coal, even though they were sitting on top of the mines.

Combination — Now, there's a tendency to reconsolidate with permission of the Coal and Steel Community. New combines include the Mannesmann and Phoenix groups.

The CSC was proposed by French Foreign Minister Robert Schuman on May 9, 1950, and became effective on July 23, 1952. It provides a common market for coal and steel without tariff barriers in Germany, France, Belgium, Luxembourg, The Netherlands and Italy, which have a combined population of 160 million.

So far, the CSC has worked to the advantage of Germany which is short on steel, yet trying to care for some of its markets overseas, including the U. S. This year, Germany is importing 2.5 million tons of finished steel from the other CSC countries (30 times more than in 1951 before the union went into effect). German exports to them (600,000 tons) are double those for 1951. To all countries, Germany is shipping 2.5 million tons, up from 2.15 million in 1954.

Small Orders—In the world market, German mills do not consider American steel producers real competition. They point out that American companies like large orders and are not so much interested in smaller lots which fit into the marketing plans of many European mills.

Dr. Gerhard Schroeder, chairman of the Iron and Steel Association, Dusseldorf, points out the need in Germany for plates and sheets, as well as skelp for pipe. Material of this type is being imported from the U. S., but German mills are looking forward to taking care of domestic requirements. For instance, Kloeckner-Werke A. G. will build a wide strip mill at Bremen. First on the schedule is a cold-strip mill which will reduce coils imported from France and the U. S. until its own hot-strip mill is ready a year later.

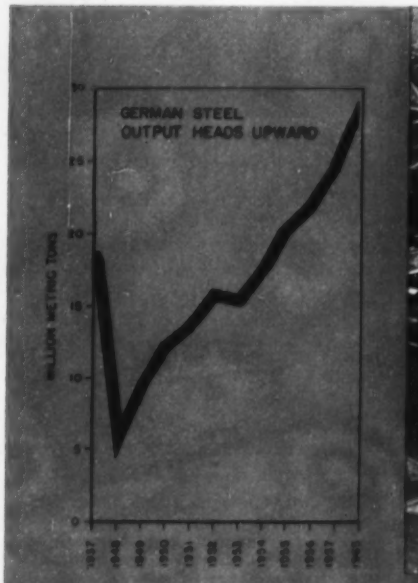
If West and East Germany are combined, Huttenwerk Salzgitter A. G. could find plenty of reason for building a strip mill. Salzgitter is a big steel plant developed in Northern Germany near Braunschweig by Herman Goering. This plant, built by H. A. Brassert, is based on local iron ore and was scheduled to have 32 blast furnaces.

Market East — Half of Salzgitter's normal market is cut off by the Iron Curtain only a dozen miles to the East. One hundred miles westward, there's competition with Ruhr mills. Salzgitter management figures there should be a market for 600,000 tons of sheets and strip a year before a strip mill can be justified. Market surveys show a potential, without East Germany, of half that.

If Salzgitter goes to 2 million tons of ingot capacity a year—and that's what its management is planning eventually—a strip mill would be added. Capacity now is 850,000 tons, but there's adequate room for expansion. Last year, a new plate mill went into operation and a continuous bar mill now is nearly ready. America is given credit for saving the steelworks from total dismantling and demolition.

Raw Materials—With prosperity and expansion, the German steel industry also is having its troubles. The great Ruhr area, where most of the steel plants are, is largely dependent upon imported iron ore. Sixty-five per cent of its ore comes from Sweden. But Sweden is short on coke, so she is holding back on ore to force Germany to step up coke shipments.

In the meantime, Germany is



Salzgitter Steelworks (founded by Herman Goering and largely dismantled) is back in operation, making plates and bars from 29-30 per cent German iron ore

Choosing a stainless steel supplier is like choosing a friend; all else appearing equal, the intangibles of service and reputation stand out. Many users of stainless steel turn to B&W because they know B&W's reputation for quality and service, and because they know that B&W controls every step in the tube-making operation from pouring the stainless ingot to carefully inspecting the finished stainless tube. Because B&W quality control more than satisfies all customer and code requirements, every buyer of B&W stainless steel tubes is assured of manufacturing skill, uniformity and close tolerances in every foot of stainless tubing he acquires, and quick service via a nationwide network of B&W stainless tubing distributors.

Take a tip from the experience of thousands in the process industries, as well as architects, designers, fabricators and finishers, and get in touch with Mr. Tubes, your link to B&W, for a detailed story of the advantages of B&W stainless tubing and how you can get more for your money with stainless. *Or write for Bulletin TB 355S.*

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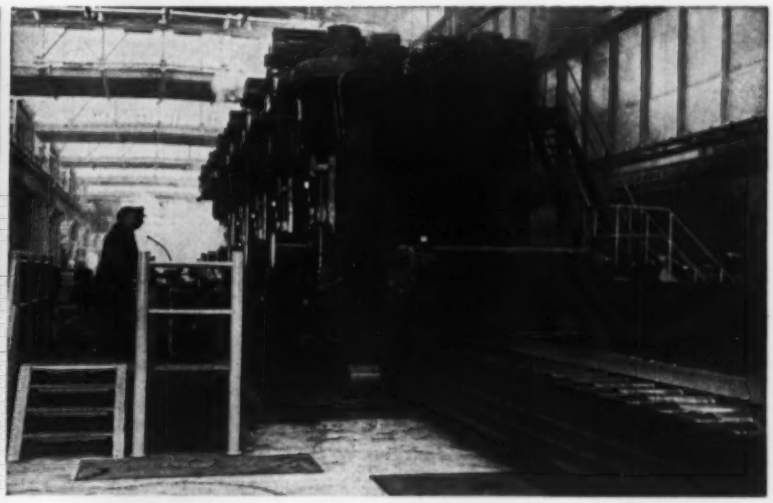
Alliance, Ohio: Welded Carbon Steel Tubing
Milwaukee, Wis.: Seamless Welding Fittings

TA-5036(P)

Hot saw line in Bochumer Verein's new Schloemann blooming and billet mill. Blooming mill has twin drives and is powered by six AEG mercury-arc rectifiers



August Thyssen bought slabs in the United States to start this new 66-in., hot-strip mill. Capacity is 1.5 million tons a year. Cold-rolled sheets and strip will be produced on Continental, 4-stand tandem mill and Wean shear line to meet growing demand of Germany's expanding metalworking industry

pinched on coking coal. Coal reserves total over 200 billion tons, but the seams are thin and irregular and at depths down to 6500 feet. A third of the mines were war damaged, and production falls short of needs by 10 million tons. The deficit is being made up by imports from the U. S. at 20 marks a ton over the local price. German mills would like to import American coke.

Germany also is getting iron ore from Norway, Spain, North Africa, South America and Africa. Some ore from U. S. Steel's Venezuelan properties is being used, and a German group is interested in a property in Newfoundland.

Local Ore — An important domestic source for iron ore is Huttenwerke Salzgitter. In five deep mines and one open pit, 6000 men are busy mining 18,000 to 19,000 tons a day. The ore runs only 29-30 per cent iron and is high in silica and phosphorus.

Concentrated to 40 per cent Fe, the coarser material is charged directly into the blast furnaces. The fines are sintered. Salzgitter management says it is making pig iron cheaper than Ruhr furnaces using high grade Swedish ore.

In making steel, Salzgitter uses both Thomas converters and tilting open hearths for duplexing, plus a soda ash treatment for reducing the phosphorus content.

Less Scrap — Scrap, too, is a headache. The CSC purchases scrap through its Brussels Scrap Association for distribution to Germany and other member countries. Substantial quantities come from the U. S. and Canada.

To decrease dependence on imported scrap, the German steel industry has set up an incentive plan for reducing the scrap-pig iron ratio in making steel. Savings are estimated at 45,000 tons a month.

There now are 103 blast furnaces in operation, compared with 84 in 1954. Two more will start soon, and two new ones will be completed in 1956.

Technical Developments — U. S. Steel, Bethlehem, Midvale and other American companies are interested in a process developed by Gusstahlwerk Bochumer Verein A. G., Bochum, for vacuum pouring high-quality, special-purpose alloy ingots for high temperature steam and other applications.

The company has two vacuum chambers (8 ft in diameter by 13½-ft high) for pouring 35-ton ingots and a third (14½-ft in diameter by 29½-ft high) for ingots up to 150 tons. The biggest vacuum ingot poured in this country weighs a little over a ton.

Director Artur Tix says Bochumer Verein has made 25,000 tons of vacuum-cast ingots and contemplates a continuous process as the next step. The method reduces oxygen, nitrogen and hydrogen and eliminates slow, costly cooling.

Low Shaft — Several companies are reported considering construction of Demag-Humboldt, low-shaft furnaces developed by Klockner-Humboldt-Deutz A. G., Cologne. A crushing, mixing and briquetting plant is needed for preparing iron ore, coal and flux. Coke oven and sintering plants are eliminated, and the furnace is a fraction of the size of conventional ones. Six low shaft furnaces are reported operating in Eastern Germany where the communists are building a new "Ruhr" in Upper Silesia.

Mannesmann has a process for continuous casting of steel in billets 6 in. square, also 4 x 6 in.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Department, STEEL, Penton Bldg., Cleveland 13, O.*

Report on Europe

Back from a six-week tour of West Europe, STEEL's editor, Irwin H. Such, reports his findings in this article, the fifth of a series.

big industry, small world

annealing covers,
billet reheating furnaces, continuous
carbon restoration and annealing furnaces, continuous
controlled atmosphere generators
high-speed stress relieving furnaces
one-way fired soaking pits
pit-type annealing furnaces
slab and billet heaters, continuous
strip annealing furnaces, continuous
strip galvanizing lines, continuous
wire patenting furnaces, continuous

Wherever this steel goes—from first soak to final shipping dock—it will find that the big steel industry is a small world as far as 'Surface' equipment is concerned. Somewhere along the line, whatever its destined shape, the steel will be made more workable and more useful in 'Surface' furnaces.

Why is it so easy to bump into 'Surface' in steel mills? One reason is that 'Surface' has literally grown up with the steel industry. A better reason is the confidence that steelmakers have in the performance of furnaces and generators manufactured by Surface Combustion Corp., Toledo 1, Ohio.

Surface
STEEL MILL FURNACES

Foreign associate companies:
British Furnaces, Ltd., Chesterfield; Stein & Atkinson, Ltd., London
Stein & Roubaix, Paris, Leige, and Genoa; Chugai Ro Kogyo Kaisha, Ltd., Osaka
Benno Schilde Maschinenbau, A.G., Bad Hersfeld (Hessen, Germany)

MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

"I'VE GOT A VIP list that would knock your eyes out!"

That's what one big machine tool builder had to say about the success of the two-week Chicago show. His enthusiasm summed up what most exhibiting builders felt.

Soft Sell—As the doors to Chicago's huge amphitheatre closed a week ago, builders tackled the tedious job of dismantling their 170 exhibits, and readying the 917 machines for shipping. By this time builders were satisfied that the show had been a success. They talked about it in superlatives.

"Terrific," one builder claimed, "it's by far the best show we've ever seen."

Selling was soft-pedaled. The immediate payoff came in terms of interest. M. A. Hollengreen, president and general manager, Landis Tool Co., and president of the Machine Tool Builders' Association, says: "Few sales actually are consummated at an industrial exposition, such as the Machine Tool Show; but exhibitors are unanimous in the opinion that a substantial number of orders for new machines shortly will be forthcoming directly as a result of it."

Not So Fast—At least three factors kept a host of machine tools from being sold outright. One was that most visitors came looking for ideas. There were plenty to be had, but it will take some more talk and thought before the ideas can be turned into purchase orders.

A second point, maybe the most obvious, is that most machine tools aren't bought off the shelf. They require bids or quotes based on special features or attachments. Most machines require calculation and design data on tooling before the sale.

A third factor is that builders would prefer to process orders through the home office, both for record keeping and tax purposes. Illinois taxes would apply to sales completed at the show.

Here's how some companies reported show sales activity:

- Jones & Lamson Machine Co.—Good interest in all machines. Looks like the show will be directly responsible for sales of at least six machines.
- Sidney Machine Tool Co.—More sales will be directly attributable to this show than any other. Already have invitations from customers to visit their plants . . . talk over quotations.
- Landis Machine Co.—Expect at least ten sales to come from the show. Expected and got big interest in new thread rolling machine.
- Gould & Eberhardt Inc.—Terrific interest in new high-speed hobbing machines. Probably will have at least two sales come directly out of the show.

Big reason for its success: The men who came to the show represented top brass. They often are relatively inaccessible to the machine tool salesman. Here was the golden opportunity to prove to them that new machines are worth buying . . . in fact, necessities for dollar-conscious operation.

High-Speed Bending

One new machine made possible a new line of products for a fastener manufacturer

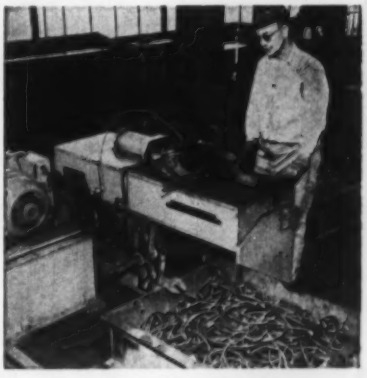
A SEMIAUTOMATIC bending machine makes up to 1600 bends an hour at the Seattle Bolt and Nut plant of Pacific Coast Steel Corp.

The unit was designed to do a better and faster job of forming eyebolts, U-bolts and hookbolts. Bethlehem Pacific engineers, who were responsible for developing the unique bender, believe it to be the only one of its kind.

Lower Cost—One new product this machine produces is a pointed meat hook, used in the handling and storing of meats. Requiring two bending operations, some 800 an hour can be turned out by one man.

In a third operation the same machine (with different attachments) puts the points on the meat hooks.

This machine has added pointed fasteners to the Seattle plant's products.



HYDRAULIC BENDER
. . . speeds manufacture of fasteners

Closer Tolerances—Improvement of some products has been brought about by the hydraulic bender. U-bolts can be held to closer tolerances, resulting in a more uniform product. The size range is substantial since the bender is used to work hot as well as cold steel.

Other fasteners produced on the bender include anchor bolts, culvert stitches and bent steel bars for modern wrought-iron furniture.

For JOBBING VERSATILITY plus HIGH PRODUCTION

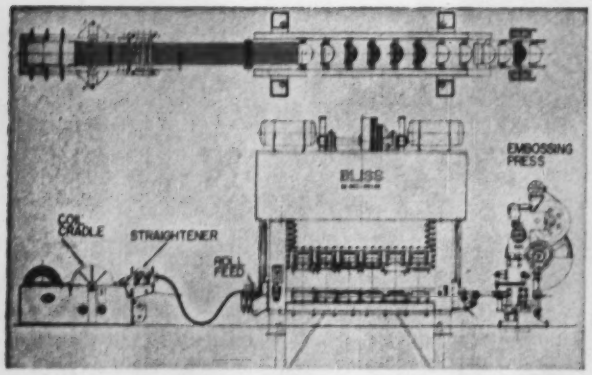
The Fellows 36-Type Gear Shaper has tremendous 'earning power'...whether used to handle virtually every job that comes up in a small gear department...or concentrated upon the heavy work in a large production shop.

A powerful, ruggedly constructed, heavy duty machine, the 36-Type can take heavy cuts at high speed... yet hold close limits. It features quick set-up, fast gear-shift change from heavy to fine feed, and simple dial adjustment from one cutter-spindle speed to another.

Ask your Fellows man to explain *all* the profit-making advantages built into the 36-Type...as well as the Fellows Plan for deferred payment.

THE FELLOWS GEAR SHAPER CO.
Head Office and Export Dept., 78 River St., Springfield, Vermont
Branch Offices: 319 Fisher Building, Detroit 2
5835 West North Avenue, Chicago 39
2206 Empire State Building, New York 1
6214 West Manchester Ave., Los Angeles 45

THE PRECISION LINE **Fellows** *Gear Production Equipment*



One of the two shelf-producing lines. Based on a 16-hour day and 50-minute hour, the lines will turn out 24,000 shelves a day

Line begins with standard mill coils loaded onto cradle. Once the coil is threaded through the five-roll straightener and into the roll feed, operation is automatic

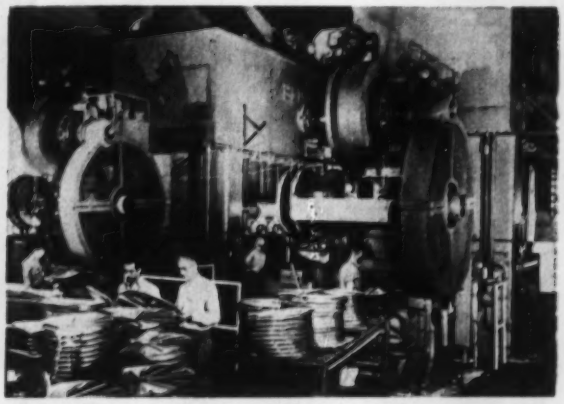
24,000 Shelves a Day

THREE transfer feed presses at Appliance Park, Louisville, produce all the refrigerator pans and shelves General Electric needs for its annual output of more than a half-million refrigerators.

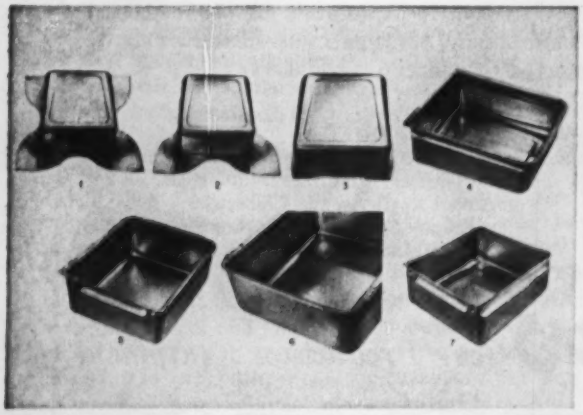
Built by E. W. Bliss Co., Canton, O., the presses have automatic coil handling equipment for producing stampings directly from mill coils.

Three Lines—Each press is in a separate line. One is a 700-ton, seven-station press that forms 12 deep-drawn refrigerator pans a minute and feeds them onto a conveyor. The other two are 800-ton, six-station units. Each of these stamps out GE's rotary and stationary refrigerator shelves at the rate of 15 a minute and feeds them into 800-ton embossing presses.

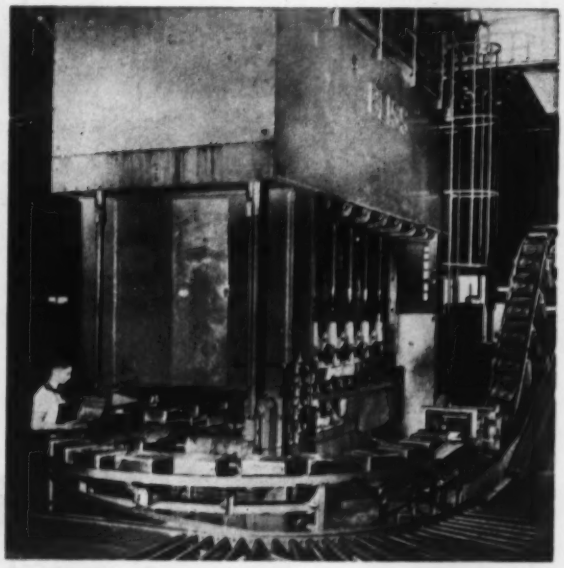
Installed cost of the five presses, automatic coil handling equipment and tooling was over $1 million. The savings they make possible are expected to bring early amortization.



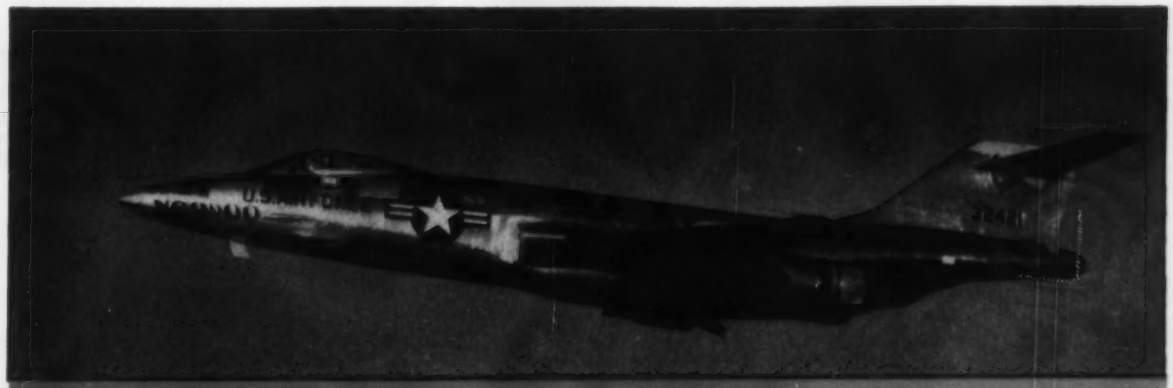
Line ends with embossing of shelves. The shelves leave the transfer feed presses and are fed automatically to the embossing presses. Unloading is by hand



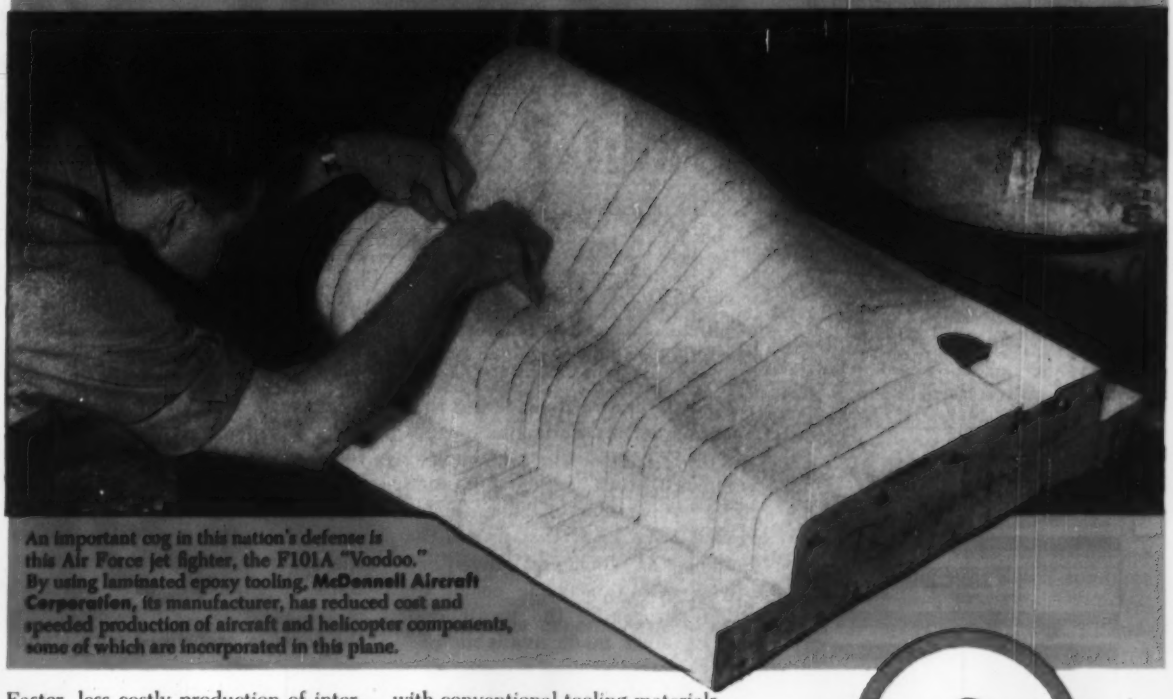
Crisper pans are made in seven steps: 1. Cutoff and draw. 2. Trim. 3. Trim. 4. Cam form sides. 5. Cam form front and pierce holes. 6. Curl flange. 7. Finish trim



An endless parade of pans, 12 every minute through two shifts, marches out of the 700-ton press and onto the conveyor. Next stop: Pickling and enameling



Compounds based on BAKELITE Epoxy Resins cut production costs, tooling time!



An important cog in this nation's defense is this Air Force jet fighter, the F101A "Voodoo." By using laminated epoxy tooling, **McDonnell Aircraft Corporation**, its manufacturer, has reduced cost and speeded production of aircraft and helicopter components, some of which are incorporated in this plane.

Faster, less costly production of interchangeable aircraft components results from the advantages of "Ren" tooling compounds based on BAKELITE Brand Epoxy Resins. For instance:

- Overall savings as high as 40 per cent have resulted where tools are adaptable to plastic.
- Weight of plastic tools is only 25 per cent that of similar steel or kirksite tools, 60 per cent that of aluminum tools.
- Savings in tooling-up time are as much as 40 per cent when compared with conventional tooling materials.
- Up to 75 per cent of all the interchangeable door panels used in one aircraft have been assembled and coordinated with tools made of BAKELITE Epoxy Resin—glass cloth laminates.

Epoxy plastic tooling compounds enabled this aircraft manufacturer to take advantage of the savings cited above. The compounds that are used are a product of **Ren Plastics, Inc.** (formerly Ren-ite Plastics, Inc.), P. O. Box No. 1256, Lansing 4, Mich.

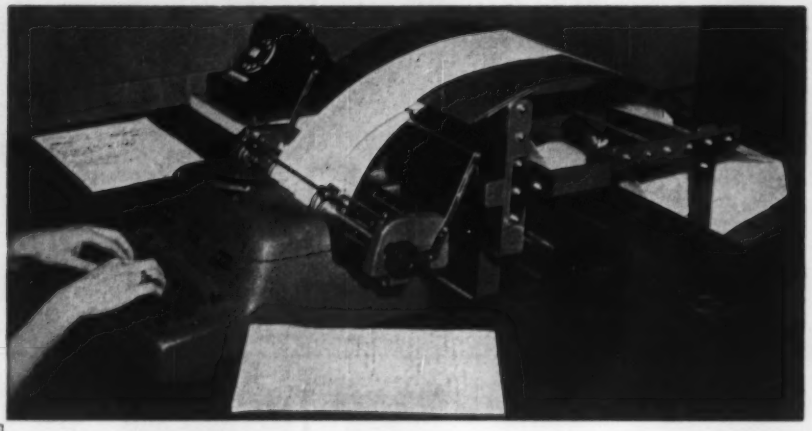
BAKELITE
BRAND
EPOXY RESINS

Visit BAKELITE's exhibit, Booth 1375, National Metal Exposition, Oct. 17-21, Philadelphia Convention Halls, Philadelphia, Pa.

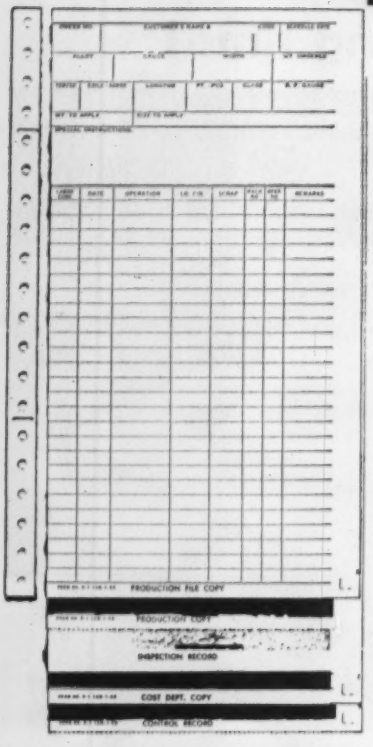
BAKELITE COMPANY, *A Division of Union Carbide and Carbon Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

The term BAKELITE and the Trefoil Symbol are registered trade-marks of UCC

By WALTER R. LOWRY
Treasurer and Assistant Secretary
The Beryllium Corp.
Reading, Pa.



Tight Rein on Inventory



Inventory control starts with this five-part continuous form which is typed in the production control department

INVENTORY CONTROL is seldom simple. When inventory moves quickly in many directions, it's like a skittish horse. It will get out of hand unless management learns to keep a tight rein.

Beryllium Corp. faced the problem. Its relatively few alloys come in numerous forms. The starter is a master beryllium-copper alloy, which the company makes into billets. They are used to produce strip, rod and wire; or castings; or as a base for alloys of lower beryllium content. Master and other alloys also are sold as billets and ingots.

Control for Profit—Holding this inventory in line while making certain that turnover was high enough to make a profit, began to assume major proportions as business expanded. We knew that unless the method of policing inventory stayed within bearable costs, we would not realize the profit that fast turnover made available.

Our control system stresses simplicity. It depends for its success on three factors:

Speed: This is achieved by aids such as tabulating and recording machines in the shop. Equally important are the continuous forms that cut down the number of times information has to be recorded. They are color coded and carbon interleaved.

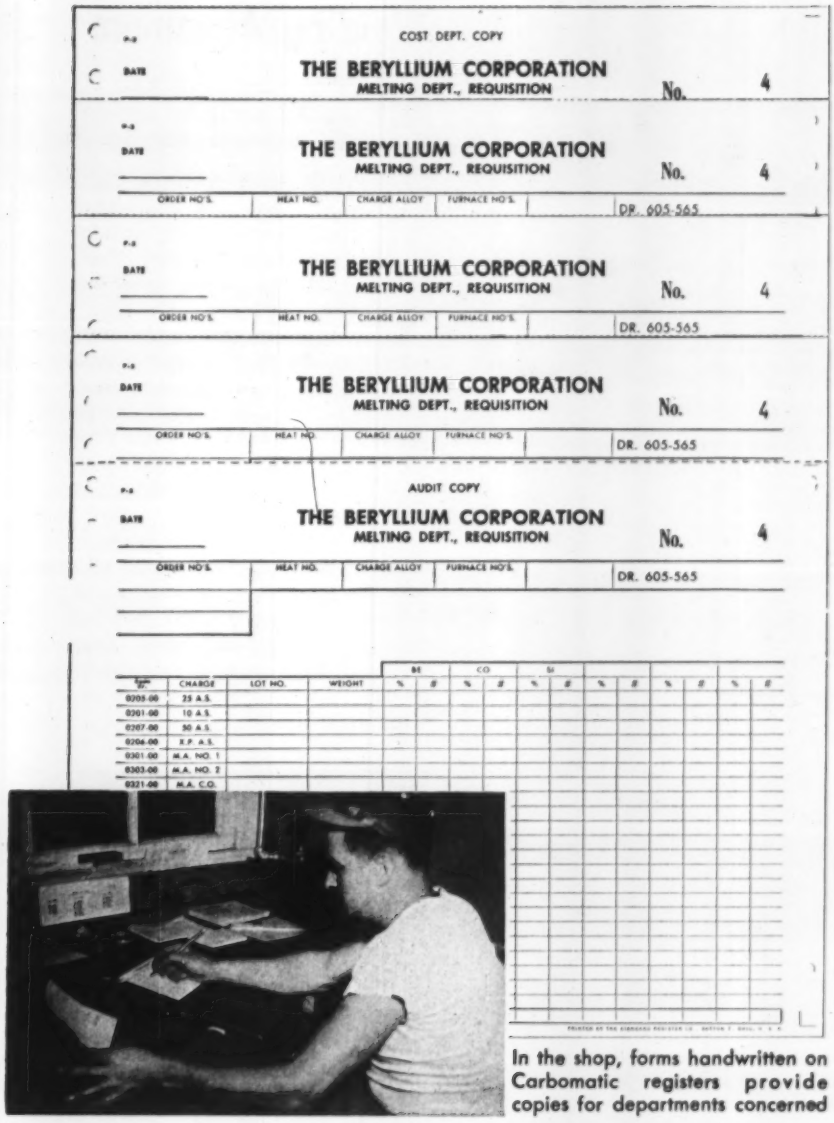
Accuracy: Educating personnel on the need for honest reporting was the first step. Carbon interleaved forms make fewer opportunities for copying errors.

Availability: There's always a copy of anything recorded locked within the recording machines. That puts the facts at management's fingertips for planning or for checking back.

Run Through—It works this way. In the production control department (heart of inventory control), a standardized form made up in several slight variations fits different types of orders. The color of the form signals whether the order is to customer specifications or a stock order—and if it is a rush order. For stock orders, the form is preprinted with standard operations.

When a customer's order is received in production control from the sales department, the base stock inventory record is consulted to set up the lead time for scheduling. Scheduling information is transmitted to the sales office concerned by teletype.

With the scheduling completed, a five-part, continuous production order is typed on an electric machine. This form carries the customer's name, order number, code, scheduled date, alloy, product specifications and the fabricating operations in sequence. A single typing of the 5¾ x 10-in. order makes five copies: Production file, production (manufacturing cost),



In the shop, forms handwritten on Carbomatic registers provide copies for departments concerned

inspection record, cost department (for statistical control) and control record (inventory) copies.

Routing — The production file copy is held in production control for posting of weights and daily production information. The manufacturing-cost copy and inspection copy move together with the job. They are protected by clear plastic envelopes.

The statistical control copy is used to follow up on orders in process. The inventory control record copy is retained in the mill stockroom for use by the order dispatcher.

Several copies are on card stock for easier handling and filing.

Handwritten Forms — Where typewriting is impractical, Standard Register Co.'s Carbomatic registers and Kant-Slip continuous forms are used. With them, clerks or foremen make handwritten reports and records. A single writing provides several control documents. All bear preprinted consecutive numbers for checking and control.

For example, in the master alloy department, a move ticket form is handwritten near the refining-melting furnace. This is a five-part form. One part on card stock has a reinforced tagcord hole in the upper right corner. This is the move ticket and stays with the job.

Move Ticket—After this form has been prepared, it is checked by the arc furnace office against the daily heat records. When an analysis is completed, results are recorded and the parts of the ticket separated and routed. One copy goes to the cost department and one is retained by the arc furnace office.

One goes to inventory control, and the move ticket stays with the melt until it goes into stock or is shipped to a customer. The fifth part is an audit copy which refolds, in a continuous, consecutively numbered strip, in a locked compartment of the register.

Another register form is used in the melting department to record the movement and analysis of ingots going from inventory into fabrication.

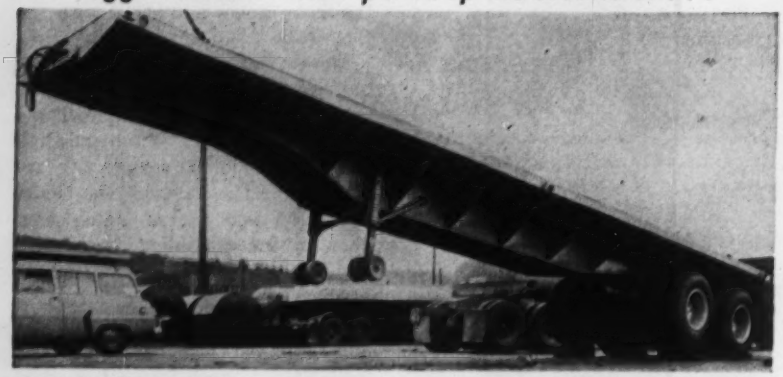
Two-in-One—A three-part form, used in the hot mill department, serves a dual purpose. The left side is the requisition form, and the right side the production record. The combined form shows the complete record of the material from the time it leaves the stock as a billet until it is returned to stock as rod or strip or is shipped. Here again, a move ticket is part of the multiple-copy form prepared by handwriting on a Carbomatic register.

In the inspection department a single writing provides a complete report of each rejection. This rejection report is a seven-part handwritten form. All copies are routed to the production office where the percentage of salvageable weight is computed.

The form is then separated and a copy goes to the foreman of the department responsible for the flaw. Other copies go to the metallurgical, quality control, production control, inspection, production and cost departments.

This integrated system of record keeping and report making has eliminated numerous posting operations and a variety of poorly designed, homemade forms. The audit copies, locked in the registers, give added assurance that the reporting which management receives from the plant is accurate and honest.

This rugged flatbed trailer points up the success of . . .



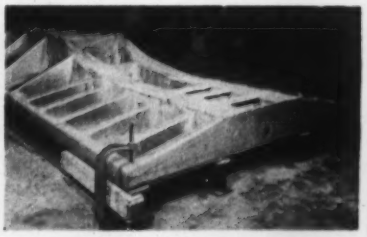
Welding Aluminum

A new, high-magnesium type alloy is welded easily by conventional semiautomatic methods

ALUMINUM alloy 5083 (a high-magnesium type) can be welded at the same speed and cost as mild steel. Applications to date: Flatbed trailers, long-span overhead cranes and boat hulls.

The prototype model of a 35-ft trailer shown in the photos was designed by Kaiser Aluminum & Chemical Corp., developer of the new alloy, and built by Beall Pipe & Tank Corp., Portland, Oreg. Now the company is fabricating production models.

Pulls Its Load—The prototype—total weight 7986 lb, payload 45,000 lb—has been in continuous service since Jan. 1, 1955, hauling pipe and structural steel over mountain highways in the Pacific Northwest. There has been no structural failure.

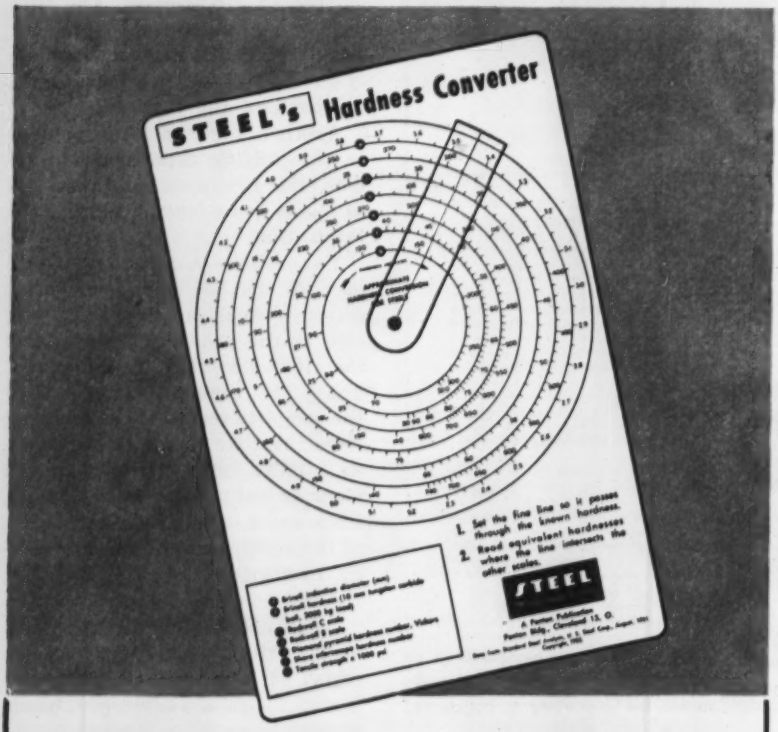


FORWARD TRANSITION SECTION
. . . box construction for extra strength

The trailer was welded with inert-gas, shielded-arc, consumable-electrode units. Experience during prototype production and production model runs established the economical and practical applications of the welded aluminum construction.

Fabrication—The flatbed was designed so it could be built with a minimum of production equipment (a press brake power shear and welding units). The aluminum—a total of 3120 lb—was mill cut specifically for the trailer to keep scrap loss down.

The trailer was built upside down without use of a jig. The center floor plate was clamped to a flat surface, and other parts were tack welded in place. No distortion was experienced.



STEEL HARDNESS CONVERTER

Here's a handy tool that can save you hours of valuable time.

Makes it possible for you to convert any known steel hardness in a matter of seconds.

(1) Set the fine line on the plastic rider so that it passes through the known hardness.

(2) Read equivalent hardness where the line intersects the other scales.

That's all there is to it!

STEEL's Hardness Converter is available to you at these prices:

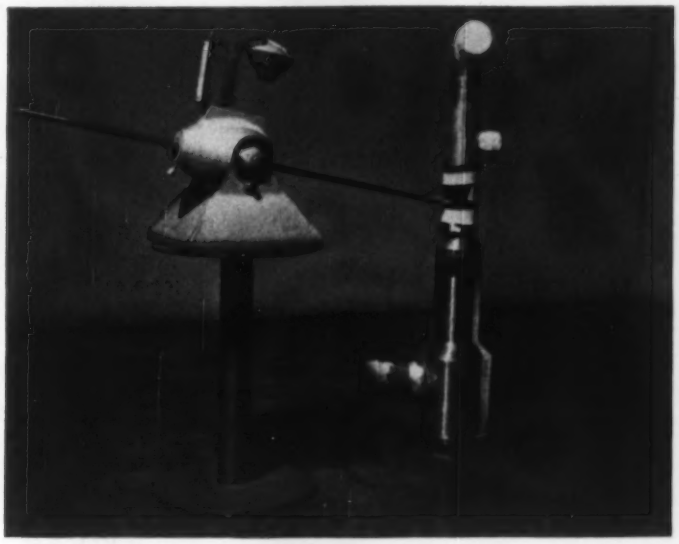
1 — 4	$ .40 each
5 — 14	.35
15 — 29	.32
30 — 49	.28
50 or more	.25

(Please send check with order)

Order yours today from:

STEEL

Reader Service Department
1213 West Third Street
Cleveland 13, Ohio



Welded pipe joint being radiographed with isotope camera using iridium 192.

It's piping with problems—

so every joint is welded—and

RADIOGRAPHED

THIS UNIT of a piping system is headed for duty never faced by piping before. High pressure? Yes. High temperature? Yes.

Critical work like this calls for welding—with radiography proving every weld sound.

Welding has a staunch friend in radiography.

In high-pressure piping, in the manufacture of pressure vessels, and in structural applications, radiography continues to open up new opportunities for welding.

Radiography can help you build business, and earn a reputation for highly satisfactory work.

If you would like to know more about what it can do for you, talk to your x-ray dealer.

EASTMAN KODAK COMPANY
X-ray Division
Rochester 4, N. Y.

Radiography...

another important example of Photography at Work

Kodak

Here is the "INSIDE INFORMATION" on FALK ALL-STEEL Shaft Mounted Drives

Take a careful look inside the Falk all-steel Shaft Mounted Drive, and you will know why this newest member of the famous Falk family is ideal for applications where direct mounting on the driven shaft is desirable. It is the only drive in its field with all these superior "In-built" factors:—

1 **All-steel Frame,** with more than double the rigidity of iron, supports all rotating elements.

2 **Precision Helical Gears,** designed and machined by Falk, rated to AGMA standards.

3 **Pressed Steel Housings,** whose sole function is to keep oil in, dirt out; easily removed for gear inspection without dismounting unit.

4 **Through Hollow Shaft** with counter bore provides for easiest installation or removal from driven machine shaft extensions.

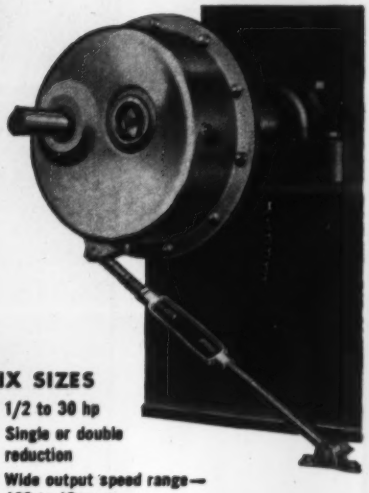
5 **Backstop** can be furnished with the unit or added later for positive prevention of reverse rotation.

6 **Positive Lubrication,** continuous direct dip of revolving elements at all speeds.

7 **Tie Rod** and turnbuckle serve as anchor and facilitate V-belt or chain adjustment.

Write to Department 247 for engineering bulletin, including selection and dimension details.

EFFICIENT SPEED REDUCTION IN LIMITED SPACE



SIX SIZES

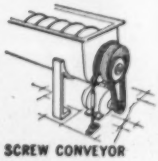
- **1/2 to 30 hp**
- **Single or double reduction**
- **Wide output speed range—420 to 10 rpm**

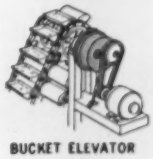
Expressly designed for topflight performance on installations requiring considerable speed reduction in limited space, the all-steel FALK Shaft Mounted Drive has quickly won acceptance throughout industry. This sturdy, compact, versatile reducing unit is an ingenious variation of the highly successful FALK Motoreducer design, pacemaker in its field for more than 20 years. Here, the time-proved design is adapted for mounting directly on the shaft to be driven, using V-belt connection to motor. Investigate now!

A FEW TYPICAL APPLICATIONS

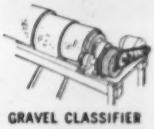
APRON FEEDER

LINE SHAFTING


SCREW CONVEYOR


BUCKET ELEVATOR

BELT CONVEYOR


GRAVEL CLASSIFIER

THE FALK CORPORATION, Milwaukee 8, Wisconsin

MANUFACTURERS OF

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry

Polishing Wheel Removes Draw Marks

This new wheel can polish any metal for plating, painting or architectural uses. Eliminated are fine grit setup wheels, rag or sisal buffs or brushes.

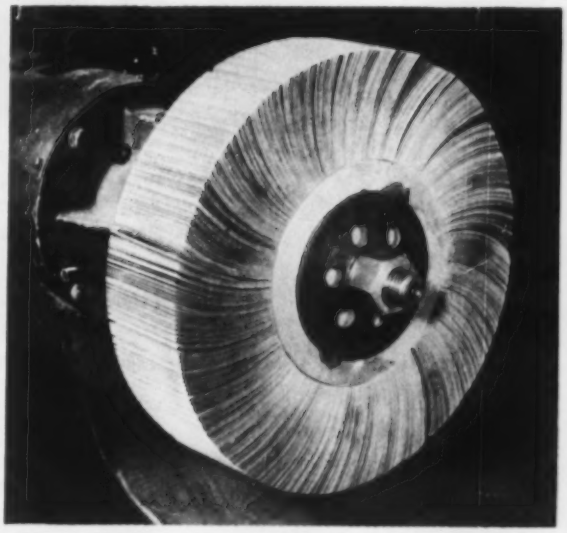
The wheel is made of hundreds of pieces of cloth coated abrasives that can be used on rotary or straight-line automatics, or on standard lathes for hand operations. The wheel is mounted on a hub assembly that adapts to any spindle.

Called the PG (polishing and grinding) wheel, it removes stock as part of its polishing action. This abrading-polishing action and the wheel's ability to conform enable it to remove mild draw marks in the same process in which it generates a buff-type finish.

Rate of cut and the microinch finish produced remain constant until the wheel is worn down to the hub. It is not necessary to increase arbor speed to maintain the cut.

The wheel is adaptable to hand or automatic operations, and it takes the shape of the part being polished. The shape remains constant during the life of the wheel.

Wheel diameters range from 14 to 17 in.; widths range from 2 to 6 in. Wheels come in a full range of polishing grits in both aluminum oxide and silicon carbide coatings. *Write*: Dept. A5-266, Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn. *Phone*: Tower 8511



New Machine Does Single and Parallel Face Flat Lapping

This high production machine uses bonded abrasive wheel laps and filtered coolant. Advantages: Lapping action is rapid, increasing output; finished parts are ready for use; costly washing operations are eliminated; and optical flats can be used for inspection because bright surfaces are produced.

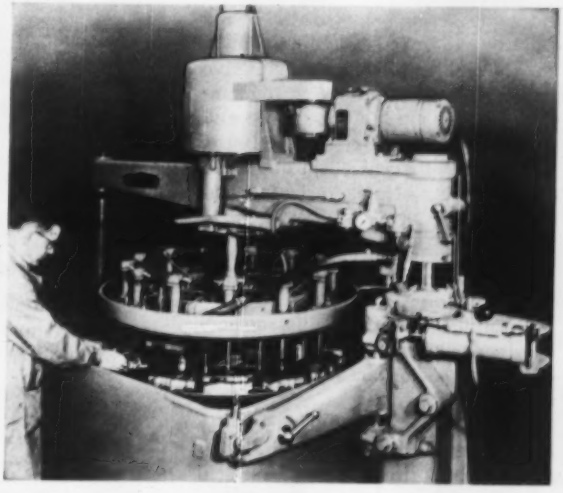
Individual adjustable speed drives for laps and workholder give the best combination for every job.

The machine can be set for a plain timed cycle, automatic continuous feed or semiautomatic continuous feed.

For single-face lapping, a bonded abrasive wheel lap (48-in. diameter) is mounted on a rigidly supported, heavy-duty, vertical spindle. Workpieces are held in suitable adapters; proper lapping pressure is secured from weights or pressure devices.

The lap face is generated and kept true by a column-mounted diamond truing arm, which is hydraulically operated.

Opposed parallel flat faces are lapped simultaneously. A column and overarm arrangement supports the upper 48-in. diameter lap. Workpieces are held in retainers between the two laps, and sizing is controlled by raising the lower lap with a "click-count" indexing wheel feed. A rotating full nut engages a feed screw. Both hand and power feed are provided.



The plain timed cycle uses an electric timer. In the semiautomatic, continuous-feed arrangement, lapping is done continuously in a single pass. Automatic continuous feeding does loading and unloading with automatic handling equipment. *Write*: Norton Co., Worcester 6, Mass. *Phone*: Pleasant 2-4641

NEW PRODUCTS and equipment

High Free-Lift Mast

This assembly is optional equipment. It does not reduce the load capacity or increase the load lever arm.

Total lifts range from 74 to 144 in. for the 400-P lift truck; 72 to 216 in. for the LT-50 and LT-56; and 74 to 160 in. for the LT-35, 390, 420, 460, 500 and 500-P. *Write*: Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O. *Phone*: Glenville 1-0900

Tube Marking

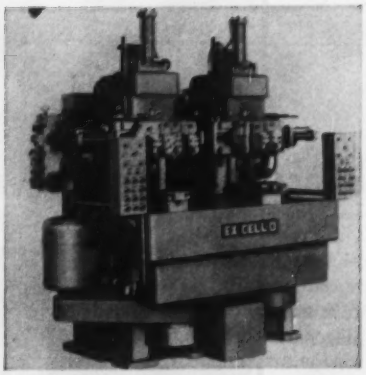
A numbering machine and an automatic cutoff are used in this automatically fed machine. Automatics can be used for consecutive numbering, nonautomatics for random numbering. Marking speed and feed are set for 86 pieces a minute. *Write*: Acromark Co., 398 Morrell St., Elizabeth, N. J. *Phone*: Elizabeth 2-6500

Vertical Boring Machine

Turning, boring, facing, grooving and chamfering are done in combinations or as separate operations.

Each of the two stations has a separate hydraulic system, counterweighted tool slide, vertical spindle, drive equipment and controls. During machining at one station, the other station can be unloaded, loaded and started on its automatic cycle.

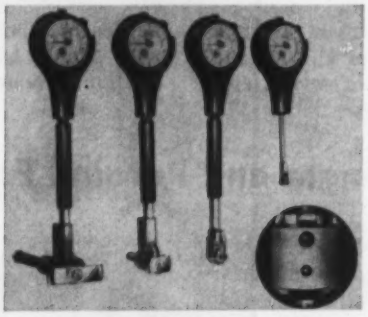
Individual controls and power equipment prevent the operation



of one station affecting the other. *Write*: Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich. *Phone*: Townsend 8-3900

Hole Gages

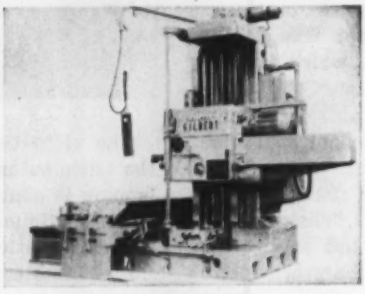
This series of adjustable dial gages checks hole diameters between ½ and 8 in. Maximum gaging size for each is twice its minimum. The gage is fully insulated, and the heat of the operator's hand cannot affect its accuracy. Inser-



tion of the gage is fast and practically foolproof. *Write*: Federal Products Corp., 1144 Eddy St., Providence 1, R. I. *Phone*: Stuart 1-9300

Boring Mills

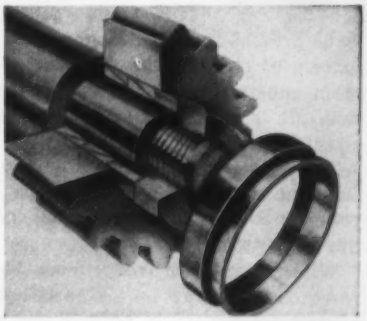
This high-speed, 4 and 4½-in. table-type, horizontal boring, drilling and milling machine has pendant control and preselective power shift of feeds and speeds.



Other features: Spindle speeds up to 1500 rpm, a built-in reversible motor and wide range of column heights, table sizes and bed lengths. *Write*: Cincinnati Gilbert Machine Tool Co., 3366 Beekman St., Cincinnati 23, O. *Phone*: Kirby 4815

Hub Fastener

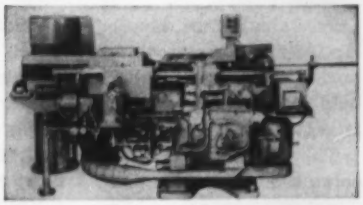
Here is a way to fasten hubs onto a shaft without the use of splines or keyways. The new element is wedged between hub and shaft under heavy pressure applied by hand tools. The outer ring expands and the inner ring contracts.



Maximum torque for a given shaft diameter is transmitted because full strength of both hub and shaft are used. The assembly consists of a straight cylindrical shaft and hub bore. Stress concentrations are eliminated and tolerances are liberal. *Write*: U. S. Automatic Corp., Amherst, O.

Piston Balancing Machine

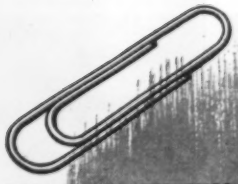
This automated machine receives, weighs, sorts, positions, clamps, machines and discharges



pistons at rates up to 720 an hour.

Pistons are machined to a tolerance of plus or minus 1 gram. Pistons grossly overweight or underweight are rejected from the machine.

Other new machines include 13



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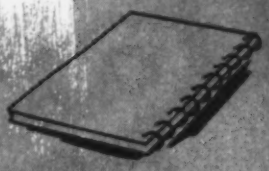
PIANO COVERING WIRE

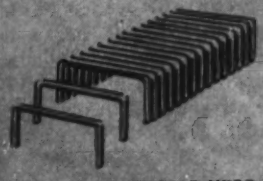
Whatever your problem is in

Wire...



COIL BINDING WIRE

FLORIST WIRE



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WIRE FOR MILK BOTTLE CARRIERS

WIRE BALES FOR BUCKETS, PAILS, ETC.

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Thousands of wire applications in over a half century—involving virtually every kind of a wire problem—that's the experience and background we offer you in solving *your* special wire problems. We can supply wire from almost the size of a human hair, through 9/16" diameter for metal fasteners . . . round wire or wire in special shapes, practically any size, temper, finish and analysis in low carbon and medium low carbon steels. We may have a valuable case history that parallels your own special problem. Fill out and return the coupon for full details of Continental's Wire Service. We are eager to work with you.

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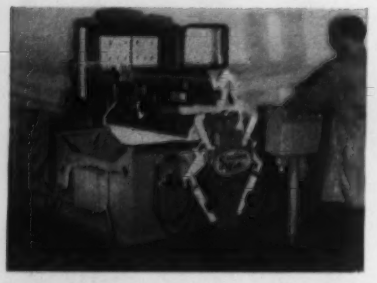
PRODUCERS OF: Manufacturer's Wire in many sizes, shapes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special wire. ALSO Coated and Uncoated Steel Sheets, Nails, Continental Chain Link Fence, and other products.

and 15-in. column radial drills and a multiple drilling machine that drills, burrs, reams, taps and spotfaces 375 carburetor air horns an hour. *Write*: Morris Machine Tool Co., 933-36 Harriet St., Cincinnati, O. *Phone*: Parkway 1-5616

Bending Machines

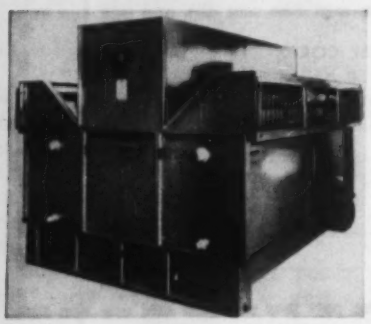
Radius bends up to 4 in. are made by adjustable tangent bending machines. Standard models come in 24, 36 and 48-in. width handling capacities.



Tooling can be applied for crowning and making upset and stretch flange radius bends. Refrigeration components, unit and space heater housings, TV and radio cabinets, electrical switch control and capacitor boxes, metal furniture components, water coolers, air conditioning units—all can be made with this unit. It comes in single wing, duplex and quadruplex types. *Write*: Titusville Divisions, Struthers Wells Corp., Titusville, Pa.

Industrial Cooling

This heat exchanger gives temperature control within 2°F and saves water. It cools by evaporation; modulating the use of outdoor air controls the temperature.



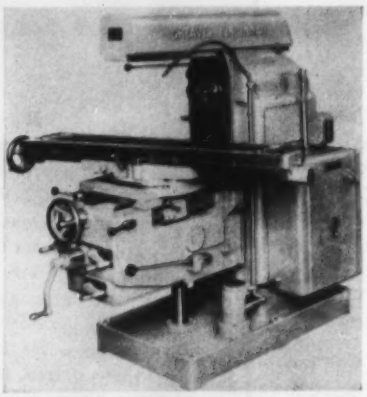
The fluid to be cooled flows through parallel coil sections that are kept drenched with a water spray. About 1000 Btu are transferred for every pound of water evaporated.

If heating (instead of cooling) is needed, it is provided by a steam or electric heater in the spray water tank.

There are four sizes; capacities range from 7 million to 18 million Btu an hour. They weigh from 9300 to 20,500 lb. *Write*: Niagara Blower Co., 405 Lexington Ave., New York 17, N. Y. *Phone*: Murray Hill 6-5363

Horizontal Milling Machine

Power losses in driving mechanisms are eliminated in this milling machine. A separate drive motor mounted in the knee provides power for the knee, saddle and table. The column-mounted motor powers the horizontal spindle.



Vertical table travel is 20 in. Power controls are centralized for all directional feeds. Feed change controls are mounted on the front of the knee. A pushbutton controls spindle rotation direction. *Write*: Greaves Machine Tool Division, J. A. Fay & Egan Co., 2011 Eastern Ave., Cincinnati 2, O. *Phone*: Plaza 1-0730

Press Brakes

Here are two new press brakes that have front controlled, variable speed drives.

The 2-30 press brake (illustrated) has a capacity of 30 tons and will bend 6 ft of 14-gage mild steel. It has a 2½-in. stroke, a 9-in. gap and a 4-in. manual ram adjustment.

The 3-50 unit has a capacity of 50 tons and will bend 6 ft of 10-gage mild steel. It has a 3-in. stroke, a ram power adjustment of 5 in. and a 12-in. gap. *Write*: Cincinnati Shaper Co., Hopple, Garrard & Elam St., Cincinnati 25, O. *Phone*: Kirby 1-5010

Plating Tanks

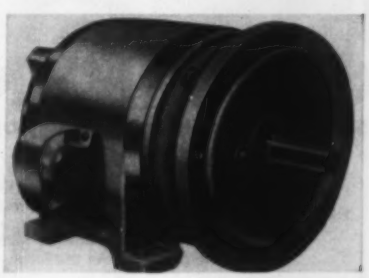
Fiberglass plastic tanks for corrosive service feature reinforcement at point-of-stress concentration. Interiors have a smooth resin surface. Heavy glass cloth and glass fiber mat are used as reinforcement throughout.

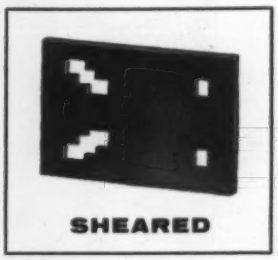
Round, square and rectangular tanks are available—from a 6-in. cube to a tank 14 x 5 x 4 ft. *Write*: Valco Corp., 1715 Roblyn Ave., St. Paul 4, Minn. *Phone*: Geneva 6449

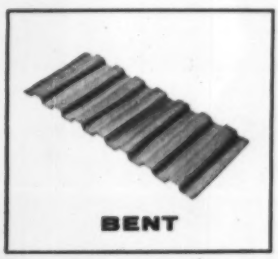
Horizontal Motors

Here is a new, 1-to-30 hp line of motors built to the rerated NEMA specs for direct connection to equipment. Style C or D (illustrated) mounting brackets are available.

The integrally cast frame is heat treated to prevent warpage. Wind-







LUKENS

STEEL PLATE SHAPES SERVICE HAS 150 MAJOR MACHINES TO PRE-FORM YOUR COMPONENTS

There's no increase in your capital investment, no added man-hours or costly patterns when you use By-Products Steel Co.'s Steel Plate Shapes Service to fill your production requirements. If you're trying to cut costs, boost output, even add new products to your line, this unique service offers over 150 major machines to help you eliminate production steps by pre-forming component parts.

Savings of 5% to 25% are possible on flame-cut, sheared, blanked, pressed and bent shapes. Parts can be supplied directly from blueprints, as formed or rough- or finish-machined. You cut fit-up and finishing costs, save scrap, freight and handling charges, reduce plate inventories and free men and machines for other jobs.

By-Products Steel Plate Shapes Service provides components that give you the weight reduction, strength and dependability of rolled steel. Direct access to the facilities of the world's leading producer of specialty steel plate means that By-Products can work from plates up to 195" wide or 25" thick, and can give you the benefits of great flexibility in forming and heat treating.

If you would like to find out how to put this Service to work, write on your letterhead for Bulletin 712. Address: By-Products Steel Co., **742** Strode Avenue, Coatesville, Pennsylvania.

STEEL PLATE SHAPES SERVICE

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A Division of Lukens Steel Company, Coatesville, Pennsylvania

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High-Carbon Ferrochromes
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Low-Carbon Ferrochrome Silicons
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And Other Specialty Alloys

Put into operation this year, Globe's new plant is the most modern in the country. Located at Beverly, Ohio, it is ideally situated for distribution of its diversified line of ferroalloy products by rail, water and truck. With five electric furnaces, Globe has a combined capacity of 32,000 KVA.

The company is staffed with highly competent and experienced operators, research and metallurgical engineers. They are available for consultation on any problem involving the use of ferroalloys.

May we discuss your needs with you?

Ferrosilicons—Made from high quality raw materials assuring a clean metal, free from segregation and inclusions. Plants at both Beverly and Jackson, O.

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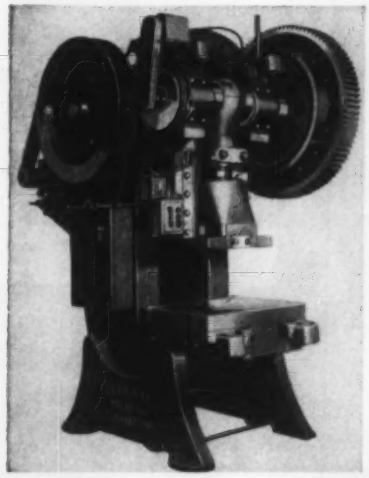
ings are asbestos protected. Rotors are cast solid and dynamically balanced. *Write*: U. S. Electrical Motors Inc., Box 2058, Los Angeles 54, Calif. *Phone*: Adams 3-3131

100-Ton Press

This new press combines precision operation with high speed and maximum safety.

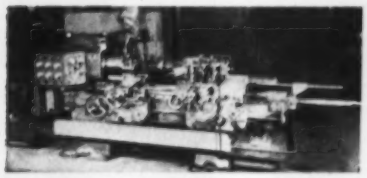


Electropneumatic control provides finger-tip starting and stopping. The press may be single-tripped (by hand or foot control), inched or operated continuously.

It is equipped with an air-actuated clutch. Safety feature: Twin solenoid valves. *Write*: Federal Press Co., Elkhart, Ind. *Phone*: Dunlop 2-5115

Turret Lathe

New features of this universal saddle-type machine improve production through correct cutting speed control, reduced operator fatigue and reduced machine handling idle time.



The machine has a motor indexed turret and pushbutton control of spindle and turret speeds.

A 40-hp, single-speed motor provides the power. The 32-speed headstock has two ranges, each with 16 forward and reverse speeds.

Another new turret lathe is completely controlled by a punched tape. Its cycling is automatic. *Write*: Jones & Lamson Machine Co., Springfield, Vt. *Phone*: Turner 5-2121

Aluminum Sealer

This product produces a chromate film on aluminum that gives excellent corrosion protection. It also serves as a paint base.

Used where hardness is not a prime factor, it has a salt spray resistance up to 600 hours. The sealer is applied easily in one dip at room temperatures. It adheres well and does not leach easily. It can be dyed in pastel colors. *Write*: Chemical Corp., 54 Waltham Ave., Springfield, Mass. *Phone*: Republic 9-5601

Connecting Rod Machine

This machine processes connecting rods used in air conditioning units. It can handle four rods with different center distances and machine two sizes of rods in the same setup.

Production is 164 pieces an hour at top efficiency. Operations include drilling and reaming the wrist pin and crank pin holes.

There are four stations—one for loading and unloading, three working. A fluid motor operates the index table. *Write*: Cross Co., Detroit 7, Mich. *Phone*: Walnut 1-3000

NEW literature

Write directly to the company for a copy

Sheet and Strip Steel

This buyer's guide lists more than 20 kinds of flat-rolled steel furnished in coils, stock sizes and blanks. It gives suggestions for stock selection and buying—bulletin 20-1, 8 pages. Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80, Ill.

Deburring

A machine for production deburring and chamfering of internal gears is described—bulletin 103-103, 2 pages. Modern Industrial Engineering Co., 14230 Birwood Ave., Detroit 38, Mich.

Sheet Grabs

These hand and motor-operated devices lift from ½ to 50 tons—4 pages. Mansaver Industries Inc., 3105 East St., New Haven 11, Conn.

Part Winding Motors

Current and torque data for 5 to 200-hp motors suited for normal and high torque applications are given—bulletin PW-1. Howell Electric Motors Co., Howell, Mich.

Forging Hammers

Cushioned helve, upright helve, upright strap and compact hammers are covered—catalog 155, 18 pages. C. C. Bradley & Son, Cortland, N. Y.

Finishing Diecastings

Recommendations give type of wheel or buff, operations required, wheel speed and abrasives needed—bulletin PP-125. Frederic B. Stevens Inc., Detroit 16, Mich.

Expanded Metals

Standard and flattened stainless steel and aluminum are described in separate bulletins—4 pages. Penn Metal Co. Inc., 205 E. 42nd St., New York 17, N. Y.

Loading

Specific loading problems and their solution are illustrated—4 pages. Materials Handling Division, Magnesium Co. of America, East Chicago 19, Ind.

Conveyor Guide

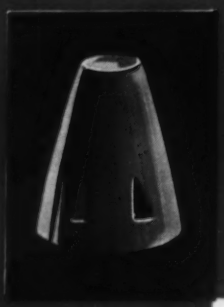
Descriptions and illustrations tell when to use pre-engineered conveyor units—20 pages. Lamson Corp., Syracuse 1, N. Y.

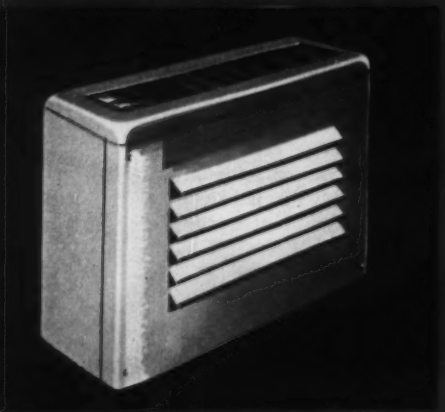
Why deep draws with

Weirzin

electrolytic zinc-coated sheets

provide important manufacturing economies





Because Weirzin has been proved to retain its amazingly uniform protective coating under extreme fabricating operations, it is specified by leading manufacturers for a wide variety of products.

Drawing and forming are performed rapidly, with complete absence of flaking, cracking, or peeling. Inventory losses due to rust are materially reduced. Heat and moisture are successfully resisted. Absence of underfilm corrosion assures not only longer life, but also adherence of paint, lacquer, enamel and lithograph ink. And, for even longer adhesion, chemically treated Weirzin is available.

When the job calls for difficult deep draws, specify Weirzin and enjoy the double advantage of quality and economy.

WEIRTON STEEL COMPANY

Weirton, West Virginia

NATIONAL STEEL CORPORATION

Market Outlook

ORDER PLACEMENT continues to be a major concern of steel buyers. They want to keep on producers' order books as far ahead and for as much tonnage as possible.

That will be their policy as long as steel demand keeps its present strength. That will be their policy even though they don't need all of the steel they're getting.

In the Detroit area, a consumer was able to pick up 100 tons of sheets which another consumer received but didn't need. With steel in over-all strong demand, everyone will take all he can get from the mills just so he will have tonnage in case he needs it. And in most cases he needs it.

BIG PUSH—Automobile producers, expecting sales of 1956 models to start off fast, are clamoring for all the steel they can get for fourth-quarter delivery. But with the fourth-quarter filled, except for a few isolated cases, attention is being focused on the first quarter. As mills don't know how much order carry-over they'll have from the fourth quarter, they're being cautious in their bookings for the first. Mills hope, though, they can be fairly current at the turn of the year. They're counting on their fourth-quarter shipments to be bigger than their order intake for that period.

HIGH AND STEADY—Mill shipments will be big if they can keep up their production pace. In the week ended Oct. 2, production maintained the same rate as in the preceding week—96 per cent of capacity.

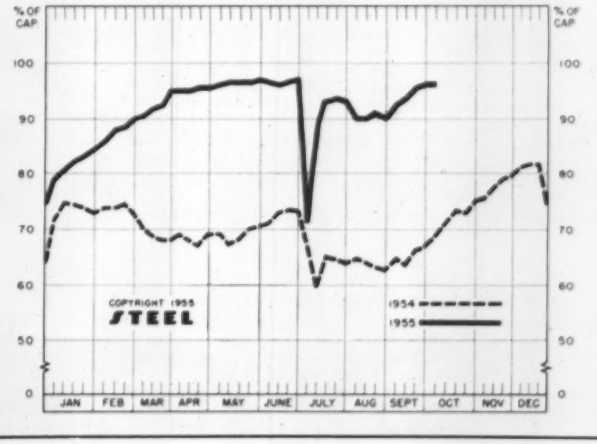
RUNNING AHEAD—Preliminary production figures show September output of steel for ingots and castings was 9.8 million tons, highest since May's 10.3 million tons. That would give a total of 85.7 million tons for the first nine months of this year. Even though the third quarter saw production losses from vacations, hot weather and a brief strike of steelworkers, the period's output exceeded that of the first quarter. Quarterly output of steel for ingots and castings was: First, 27.3 million tons; second, 29.9 million tons; and third, 28.5 million.

UP TO INDUSTRY—Rejection by the Office of Defense Mobilization of proposals for fast tax amortization of steel ingot capacity expansions is not to be interpreted as government belief there is sufficient steel capacity. The rejection means only that ODM thinks there are enough facilities to meet mobilization needs. Arthur S. Flemming, mobilization director, says it is the responsibility of private industry to provide capacity to meet the rising level of civilian demand.

WANTED: PLATES—One area where the government recognizes a shortage of capacity for mobilization is in heavy steel plates. Fast amortization is still permitted for them. Right now, the plate supply is far behind demand. They're wanted by the construction industry, line pipe producers and railroad carbuilders. Shipbuilders' needs are rising and will be felt even more strongly after the turn of the year.

PRICES—Steel prices are unchanged, except for tin mill products. They rose Oct. 1, and did not affect STEEL's finished steel price composite for the week ended Sept. 28. Composite for that week was $127.41 a net ton.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Oct. 2	Change	Same Week 1954	Same Week 1953
Pittsburgh	99	— 0.5	69	100
Chicago	96	— 1.5*	71	98.5
Mid-Atlantic	94	+ 1	58	97
Youngstown	100	0	57	105
Wheeling	97.5	+ 1	86.5	97.5
Cleveland	98.5	— 2*	77.5	93.5
Buffalo	105	0	66	106.5
Birmingham	95.5	0	71	96.5
New England	88	0	48	82
Cincinnati	87	+ 2	64	85
St. Louis	88.5	— 4	69	96
Detroit	98.5	+ 3.5	75	101.5
Western	99	+ 5	87	103
National Rate	96	0	68.5	95

INGOT PRODUCTION‡

	Week Ended Oct. 2	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	144.2†	144.4	140.4	104.5
NET TONS (In thousands)	2,316†	2,320	2,255	1,678

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,413,278 in 1955; 2,384,549 in 1954; 2,254,459 in 1953.

Metalworking Outlook—p. 31

Technical Outlook—p. 69

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Sept. 27 1955	Sept. 20 1955	Month Ago	Sept. Average
(1947-1949=100)	153.9	153.9	153.9	153.9

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Sept. 27

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.200
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	7.993
Tie Plates	5.625	Strip, C.R., Stainless, 430 (lb)	0.444
Axles, Railway	8.000	Strip, H.R., Carbon	5.350
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.366
Plates, Carbon	4.950	Pipe, Galv., Buttweld (100 ft)	19.971
Structural Shapes	4.867	Pipe, Line (100 ft)	158.925
Bars, Tool Steel, Carbon (lb)	0.460	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H.R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steels, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.375	Tubing, Mechanical, Stainless, 304 (100 ft)	178.897
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.533
Bars, H.R., Carbon	5.350	Tin Plate, Electrolytic, 0.25 lb	7.233
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.333
Bars, C.F., Carbon	8.660	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.175	Wire, Drawn, Stainless, 430 (lb)	0.578
Bars, C.F., Stainless, 302 (lb)	0.468	Bale Ties (bundle)	6.473
Sheets, H.R., Carbon	5.145	Nails, Wire, 8d Common	8.618
Sheets, C.R., Carbon	6.239	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.690	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless, 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	Sept. 28 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	207.63	207.63	207.63	194.19	156.99
Index in cents per lb	5.625	5.625	5.625	5.261	4.253

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$127.41	$127.41	$127.41	$117.77	$94.50
No. 2 Fdry, Pig Iron, GT	58.99	58.99	58.99	56.54	48.84
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	47.72
Malleable Pig Iron, GT	59.77	59.77	59.77	57.27	49.13
Steelmaking Scrap, GT	45.00	44.33	43.83	30.50	41.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point

FINISHED STEEL	Sept. 28 1955	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.45
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.45
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	3.93
Bar, C.F., Pittsburgh	5.90	5.90	5.90	5.40	4.10-4.15
Shapes Std., Pittsburgh	4.60	4.60	4.60	4.25	3.40
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.40
Shapes, deld., Philadelphia	4.88	4.88	4.88	4.53	3.46
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.50
Plates, Chicago	4.50	4.50	4.50	4.225	3.50
Plates, Coatesville, Pa.	4.50	4.50	4.50	4.225	3.90
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.50
Plates, Claymont, Del.	4.50	4.50	4.50	4.225	3.90
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.35
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.35
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.10
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.30
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.40
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.50
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.25
Strip, C.R., Pittsburgh	6.25-6.45	6.25-6.45	6.25-6.45	5.75	4.15-4.50
Strip, C.R., Chicago	6.35-6.45	6.35-6.45	6.35-6.45	6.00	4.30
Strip, C.R., Detroit	6.35	6.35	6.35	5.60-5.90	4.35-4.95
Wire, Basic, Pittsburgh	6.25	6.25	6.25	5.75	4.50
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.30
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.50
SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$63.00
Wire rods, ⅜-⅝" Pitts.	5.025	5.025	5.025	4.675	3.85
PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$59.50	$59.50	$57.00	$48.50
Basic, Valley	58.50	58.50	58.50	56.00	47.50
Basic, deld. Phila.	59.16	59.16	59.16	49.66	50.39
No. 2 Fdry, Pitts.	59.00	59.00	59.00	56.50	49.50
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	45.00
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	49.50
No. 2 Fdry, deld. Phila.	59.66	59.66	59.66	50.16	50.89
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	45.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.43	52.58
Malleable, Valley	59.00	59.00	59.00	56.50	49.50
Malleable, Chicago	59.00	59.00	59.00	56.50	48.00
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	190.00†	175.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$43.50	$43.50	$43.00	$30.50	$44.00
No. 1 Heavy Melt, E. Pa.	46.50	46.50	46.50	29.00	39.00
No. 1 Heavy Melt, Chicago	45.00	43.00	42.00	32.00	40.00
No. 1 Heavy Melt, Valley	46.50	46.50	46.50	32.50	43.75
No. 1 Heavy Melt, Cleve.	44.00	44.00	44.00	30.50	43.25
No. 1 Heavy Melt, Buffalo	38.50	38.50	39.50	28.50	41.50
Rails, Rerolling, Chicago	64.50	64.50	64.50	51.50	61.00
No. 1 Cast, Chicago	47.50	47.50	46.50	38.50	50.50
COKE, Net Ton					
Beehive, Furn, Connlsvl.	$13.625	$13.625	$13.625	$14.75	$14.25
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	16.50
Oven, Fdry, Chicago	25.75	25.75	25.75	24.50	21.00

Daily Nonferrous Price Record

	Price Sept. 28	Last Change	Previous Price	Aug. Avg.	July Avg.	Sept. 1954 Avg.
Copper	43.60-50.00	Sept. 12, 1955	43.00	37.759	36.000	30.000
Lead	15.30	Sept. 26, 1955	14.80	14.800	14.800	14.400
Zinc	13.00	Sept. 6, 1955	12.50	12.500	12.500	11.900
Tin	96.875	Sept. 28, 1955	96.75	96.519	97.045	93.545
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	60.000
Aluminum	24.40	Aug. 8, 1955	23.20-24.40	24.267	23.200	22.200
Magnesium	32.50	Aug. 16, 1955	28.50	30.574	28.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

OUTLOOK MARK
MARKET OUTLOOK

Nonferrous Metals

Proposals for ending the copper shortage show how desperate fabricators are becoming. Most plans are impractical or would require revisions in the law

Nonferrous Metal Prices, Pages 106 & 107

WASHINGTON has been deluged with every kind of plan copper users can devise to ease the red metal shortage. But the fact remains: Their only help will come from increased supply, decreased demand or both.

One plan requests the President to release up to 100,000 tons of copper from the stockpile. It is impossible to release even 1 lb under the present law. An emergency exists for some members of the industry, but the law specifies national emergency, which this is not.

Copper for Wheat—James T. Patterson, Republican representative from the Naugatuck valley in Connecticut, has come up with a plan which asks the government to barter surplus farm products for foreign copper and to buy copper in the world market for resale to users at the current domestic price. Assuming such a plan were possible, the time required to get it in operation would rule it out as an immediate aid.

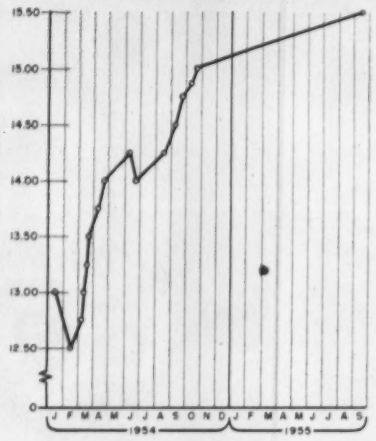
In addition, this plan, as well as most others, overlooks one important fact: The present shortage is worldwide, and there probably isn't any excess copper to be had on the open market. If the United States government were to enter the market as a bidder for the red metal, the world price inevitably would rise. Uncle Sam would have to sell this high-priced copper to users at the average domestic price, which is now about 44 cents a pound. The difference would amount to a subsidy by the government, and Washington has not been inclined to favor such handouts. Furthermore, U. S. scrap prices, which seem to follow the world price, would spiral and hurt the brass mills more than ever.

Death Blow—In the final analysis, this plan would get the ax because it is doubtful that it is legal. If the Department of Agriculture managed to barter some wheat for Chilean copper, there would have to be the transfer of funds and title so the Office of Defense Mobilization could get the metal into Defense Production Act inventory. Metal from this source has been used only for extreme hardship cases, flood relief and defense use. It would be hard to justify relief just to assure an industry of full employment.

Another proposal made by fabricators: ODM should stockpile as much as 100,000 tons of copper in the mills themselves rather than in warehouses. The mills would use the metal, promising it at all times to have in storage or in process no less than the 100,000 tons. The government would not give up title to the metal and would have full control over it whenever it wished. In an emergency, fabricators argue, the copper would be used for government work, saving the time and expense of getting it from stockpile to the fabricating plant. This plan is practically the same as the one asking for outright loan of 100,000 tons, which the government has turned down. The metal still would be borrowed, no matter where the government stored it.

LEAD PRICE

Major Steps on Comeback Trail
(Cents per pound, New York)



Distribution would be a tricky problem for any plan involving such government aid. The metal would have to be allocated, and that would involve some degree of government control. Industry doesn't want that.

More Life for LIFO—Copper users also have asked for an extension of the LIFO (last in, first out) inventory method. They don't want to take a tax beating on their liquidated inventories, which have been carried at low cost. LIFO was initially a defense measure, and some quarters believe Congress would balk at extending it past its expiration date of Dec. 31. Besides, Congress won't be back in session until after Jan. 1—too late to do any good in the present shortage. There has even been some talk about a copper loan from Great Britain, but nobody treats that seriously. Copper is short over there, too.

Sad Song—So it looks like the shortage will continue unabated for some time. Eventually, demand and supply will come into balance. But when that happens, producers have the extra burden of repaying the government for its help since last October. Through the third quarter, the dole amounted to 26,000 tons (repayment date is June 30, 1956). Another 11,000 tons is authorized for the fourth quarter (repayment date, Sept. 30, 1956). There is little doubt in Washington that the government will postpone the repayments further if the shortage continues. But, eventually, it must be paid back.

Lead Makes Move Up

Lead, which for almost a year was one of the most stable metals price-wise, moved up a half cent on the price scale on Sept. 23 and is pegged at 15.50 cents a pound, New York. A strong market, shrinking stocks and increased labor costs made the move possible. It had been thought by many observers that the increase would not come despite the favorable conditions because of uncertainty about the government's attitude. At one time, the combined level of 28 cents a pound for lead and zinc was considered the top price at which the government would buy for stockpile. Although there has been little interest in offering metal for stockpile recently, producers are counting on the government coming to the rescue if the market slumps. The graph at left shows that with minor exceptions, the price of lead has been on the uptrend since early 1954. There have been 16 price changes in that time.

Market Memos

- Of the major metals, nickel alone has maintained a steady price so far in 1955. From Jan. 3 to Sept. 23, the Bureau of Labor Statistics index for metals rose from 99.5 to 119.8 per cent (1947-1949=100).
- Following the lead price rise, rumor had it that zinc might advance again. Demand is still strong, even at 13 cents a pound.

Looking for a TOUGHER STEEL?

Unusually tough, even at sub-zero temperatures, Lukens "T-1" steel can reduce equipment costs.

Failure from abrasion or from impact can happen to the steel in your equipment, too. Here's the answer—the tougher steel you've been looking for. Lukens "T-1" steel has excellent resistance to the combination of wear and impact, is tough enough to withstand unusual stresses and pressures as well as shock at either sub-zero or high temperatures, thus lowering maintenance costs and lengthening equipment life.

Equipment builders will find that the techniques of working with this new steel are no different than with carbon steel. Lukens "T-1" steel can be fabricated not only in the shop but also in the field, through proper design procedures. Because of its high yield strength (over 90,000 psi) this new steel offers lighter weight and reduced thickness in comparison to heavier, thicker plates of carbon steel, thereby reducing material, fabrication and shipping costs. And Lukens' range of steel plate sizes—including the widest and heaviest plates available anywhere—makes possible additional savings for equipment builders through the use of wider plates that require fewer welded seams.

The latest addition to Lukens' complete line of carbon, alloy and clad steels, this quenched and tempered alloy plate steel's unusual combination of properties suit it especially to application in pressure vessels, bridges, shipbuilding, construction machinery and general industrial equipment. On problems of design, selection, application and fabricating techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write for the new 28-page Bulletin 781. Address: Manager, Marketing Service, 773 Lukens Building, Lukens Steel Company, Coatesville, Pa.

LUKENS

"T-1" STEEL

THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS

LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 24.40, pigs 22.50. 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.2; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 27.80, No. 356, 7% Si, 0.3% Mg, 26.20.

Antimony: R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.50-28.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest; custom smelters, 50.00 deld.; Lake, 43.00 deld.; Fire refined, 42.75 deld.

Germanium: 99.9% $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $90-$110 nom. per troy oz.

Lead: Common, 15.30, chemical, 15.40, corroding, 15.40, St. Louis. New York basis, add 0.20.

Lithium: 99% +, cups or ingot, $11.50; rod, $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8%, self-palletizing pig, 32.50; notched ingot, 33.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, G, H and R, 36.00; alloy M, 38.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50.

Mercury: Open market, spot, New York, $269-$275 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced, $3-$3.25 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom., per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $91-$96 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $9-$10 per lb.

Silver: Open market, 90.75 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 96.875; prompt, 96.75.

Titanium: Sponge, 99.3+ %, grade A-1 ductile (0.3% Fe max), $3.95, grade A-2 (0.5% Fe max), $3.50 per pound.

Tungsten: Powder, 98.8%, carbon, reduced, 1000-lb lots, $4.50 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99+ % hydrogen reduced, $4.65. Treated ingots, $6.70.

Zinc: Prime Western, 13.00; brass special, 13.25; intermediate, 13.50, E. St. Louis, freight allowed over 0.50 per pound. High grade, 14.35; special high grade, 14.50, deld. Diecasting alloy ingot No. 3, 17.25; No. 2, 18.25; No. 5, 17.75, deld.

Zirconium: Ingots, commercial grade, 14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, $10 per lb. Powder electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 32.00-33.75; No. 12 foundry alloy (No. 2 grade), 31.00-31.25; 5% silicon alloy, 0.60 Cu max, 32.50-32.75; 13 alloy, 0.60 Cu max, 32.50-32.75; 195 alloy, 32.75; 108 alloy, 31.00. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 30.50-31.75; grade 2, 29.50-30.75; grade 3, 28.50-30.00; grade 4, 28.00-29.50.

Brass Ingot: Red brass No. 115, 42.50; tin bronze No. 225, 56.50; No. 245, 48.75; high-leaded tin bronze No. 305, 45.75; No. 1 yellow No. 405, 34.75; manganese bronze No. 421, 38.25.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.84; rod, bar, wire, $1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.88; l.c.l., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.l., 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.l., 56.27.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21 per cwt; pipe, full coils, $21 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $14.00-$14.50; sheared mill plate, $11.00; strip, $14.00-$14.50; wire, $10.00-$10.50; forging billets, $8.75; hot-rolled and forged bars, $8.75.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00; ribbon zinc in coils, 20.50; plates 19.50-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	96
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks	...	65	...

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	57.9	56.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	71.7
0.219-0.234	54.5	52.9	...	...
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2
Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	53.6	52.3
Rolled				
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

ALUMINUM

Sheets and Circles: 110 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	37.5	42.3	...	...
0.135-0.096	38.0	43.2	...	...
0.095-0.077	38.7	44.2	36.1	41.3
0.076-0.061	39.3	45.1	36.3	41.5
0.060-0.048	39.9	45.6	36.7	42.0
0.047-0.038	40.4	46.5	37.2	42.4
0.037-0.030	40.8	47.0	37.6	43.1
0.029-0.024	41.4	47.5	37.9	43.6
0.023-0.019	42.2	49.0	38.8	44.5
0.018-0.017	43.0	...	39.4	45.4
0.016-0.015	43.9	...	40.2	46.6
0.014	44.9	...	41.2	47.9
0.013-0.012	46.1	...	41.9	48.9
0.011	47.1	...	43.1	50.5
0.010-0.0095	48.4	...	44.3	52.2
0.009-0.0085	49.7	...	45.8	54.3
0.008-0.0075	51.3	...	47.0	56.1
0.007	52.8	...	48.5	58.4
0.006	54.4	...	49.9	63.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam. 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 in. lengths.

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.10, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.85	2	$ 51.95
1	26.50	4	143.00
1¼	35.85	6	256.70
1½	42.90	8	386.30

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032 in., 99c; 0.064 in., 78.00c; 0.125 in., 63.50c, 30,000 lb and over, f.o.b. mill.

Plate: AZ31, 61.00c, 30,000 lb or more, 0.250 in. and over, widths 24-60 in., lengths 72-180 in.; tread plate, 64.00c, 30,000 lb or more, ¼-in. thick, widths 24-60 in., lengths 60-192 in.; tooling plate, 66.00c, 30,000 lbs or more, .250-3.000 in., widths 60-72 in., lengths 72-180 in.

Extrusions: AZ31 commercial grade, rectangles, ¼ x 2 in., 64.70c; 1 x 4 in., 69.50c. Rod, 1 in., 61.50c; 2 in., 59.00c. Tubing, 1 in. OD x 0.065 in., 82.50c; Angles, 1 x 1 x ⅛-in., 68.40c; 2 x 2 x ¼-in., 62.50c. Channels, 5 in., 63.40c. I-beams, 5 in., 62.70c.

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 19.50; old sheets, 17.00-17.50; borings and turnings, 11.00-11.50; crankcases, 17.00-17.50; industrial castings, 16.70-17.50.

Copper and Brass: No. 1 heavy copper and wire, 39.50-40.50; No. 2 heavy copper and wire, 38.50-39.50; light copper, 36.50-37.50; No. 1 composition red brass, 30.50-32.00; No. 1 composition turnings, 29.50-31.00; yellow

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	62.76b	60.36c	....	62.82	39.000	39.000	38.250
Yellow Brass	52.27	42.41d	52.81	55.18	38.875	38.625	36.750
Red Brass, 85%	58.09	58.03	58.63	60.90	34.250	34.000	33.500
Low Brass, 80%	56.55	56.49	57.09	59.36	32.750	32.250	31.750
Naval Brass	55.63	49.94	62.69	58.79	36.750	36.500	36.000
Com. Bronze, 90%	60.18	60.12	60.72	62.74	35.750	35.500	35.000
Nickel Silver, 10%	66.00	65.33g	66.33	....	32.500	32.250	16.250
Phos. Bronze, A, 5%	80.99	81.49	81.49	82.67	39.250	39.000	38.000
Silicon Bronze	66.54	65.73	66.58	68.68e	37.625	37.375	36.875
Manganese Bronze	59.37	58.33	63.82	....	27.000	26.750	25.750
Munts Metal	53.74	49.55	....	....	27.000	26.750	26.250

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

brass turnings, 18.50-19.00; new brass clippings, 25.00-26.50; light brass, 18.50-19.50; heavy yellow brass, 22.00-22.50; new brass rod ends, 23.50-25.00; auto radiators, unsweated, 24.00-25.00; cocks and faucets, 24.50-26.50; brass pipe, 25.00-27.00.

Lead: Heavy, 12.00-12.50; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.75; electrotype, 12.00-12.75; mixed babbitt, 14.50.

Magnesium: Clippings, 18.50-19.50; clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 44.50-60.00; old sheets, 40.00-45.00; turnings, 34.00; rods, 44.50-60.00.

Nickel: Sheets and clips, 90.00-92.00; rolled anodes, 90.00-92.00; turnings, 75.00; rod ends, 90.00-92.00.

Zinc: Old zinc, 5.50-6.00; new die-cast scrap, 5.00-5.75; old die-cast scrap; 3.50-4.00.

REFINER'S BUYING PRICES
(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 23.00; 3003 clippings, 22.75-23.00; 6151 clippings, 22.50-23.00; 5052 clippings, 22.50-23.00; 2014 clippings, 21.50-22.00; 2017 clippings, 21.50-22.00; 2024 clippings, 21.50-22.00; mixed clippings, 21.50-22.50; old sheet, 19.50; old cast, 19.50; clean old cable (free of steel), 22.50-23.00; borings and turnings, 19.50-20.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 65.00; light scrap, 60.00; turnings and borings, 43.00-55.00.

Copper and Brass: No. 1 copper and wire, 44.00; No. 2 copper and wire, 42.00-42.50; light copper, 39.75-40.00; refinery brass (60% copper) per dry copper content, 38.50.

INGOTMAKERS' BUYING PRICES
(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 copper and wire, 44.00; No. 2 copper and wire, 42.00-42.50; light copper, 39.75-40.00; No. 1 composition borings, 34.00-34.50; No. 1 composition solids, 34.50-35.00; heavy yellow brass solids, 24.00-25.00; yellow brass turnings, 23.00-25.00; radiators, 26.00-28.00.

PLATING MATERIAL
(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 59.42, oval, 58.92, 5000-10,000 lb; electrodeposited, 56.78, 2000-5000 lb lots; cast 62.54, 5000-10,00 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 96.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.155 200-499 lb, $1.14, 500-999 lb, $1.135; 1000 lb or more, $1.13.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100-1000 lb, 80.00; 1000 lb and over, 78.00; effective Sept. 1, 1955.

Copper Sulphate: Crystal, 100 lb, 21.50; 200 lb, 18.50; 300 lb, 17.50; 400 lb, 17.00; 500-1900 lb, 15.50; 2000-10,000 lb, 15.25; 10,000 lb and up, 15.15. Powder, add 0.5 to above prices. Effective Mar. 29, 1955.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 83.125; 16-oz bottle, 81.875; 80-oz bottle, 79.375; 100-oz bottle, 79.375; f.o.b. St. Louis, New York and Los Angeles. Effective Apr. 6, 1955.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 73.00; 100-600 lb, 58.6; 700-1900 lb, 56.1; 2000-9900 lb, 54.4; 10,000 lb or more, 53.2.

Stannous Chloride (Anhydrous): Less than 50 lb, $1.594; 50 lb, $1.254; 100-300 lb, $1.104; 400-900 lb, $1.08; 1000-1900 lb, $1.055; 2000-4900 lb, $1.019; 5000-19,900 lb, 95.8; 20,000 lb or more, 89.7.

Stannous Sulphate: Less than 500 lb, $1.293; 50 lb, 99.30; 100-1900 lb, 97.30; 2000 lb or more, 95.3.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

it's no gamble!

SWITCH TO Super LA-LED STEEL

it REPLACES BRASS

for many machined parts!

What is Super LA-LED? It's the fastest machining steel bar commercially available . . a steel that maintains production rates approaching those of brass.

Super LA-LED's relatively low cost saves you money . . gives you a quality part where brass is now used principally because of machinability.

Ask for your copy of this descriptive brochure, "Super LA-LED Replaces Brass."

La Salle STEEL CO.

1414 150th St., Hammond, Indiana

Manufacturers of the Most Complete Line of Quality Cold-Finished Steel Bars in America

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 109. Key to footnotes, page 111.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 .....$65.50

INGOTS, Alloy (NT)
Detroit R7 .....$69.00
Houston S5 .....74.00
Midland,Pa. C18 .....69.00
Munhall, Pa. U5 .....69.00

BILLETS, BLOOMS & SLABS
Carbon, rerolling (NT)
Aliquippa,Pa. J5 ....$68.50
Bessemer,Pa. U5 ....68.50
Bridgeport,Conn. N19..73.50
Buffalo R2 .....68.50
Clairton,Pa. U5 .....68.50
Ensley,Ala. T2 .....68.50
Fairfield,Ala. T2 .....68.50
Fontana,Calif. K1 ....76.00
Gary,Ind. U5 .....68.50
Johnstown,Pa. B2 ....68.50
Lackawanna,N.Y. B2 ..68.50
LoneStar,Tex. L6 .....74.50
Munhall,Pa. U5 .....68.50
Pittsburgh J5 .....68.50
S.Chicago,Ill. R2, U5..68.50
S.Duquesne,Pa. U5 ....68.50
Youngstown R2 .....68.50

Carbon, Forging (NT)
Aliquippa,Pa. J5 ....$84.50
Bessemer,Pa. U5 ....84.50
Bridgeport,Conn. N19..89.50
Buffalo R2 .....84.50
Canton,O. R2 .....86.50
Clairton,Pa. U5 .....84.50
Conshohocken,Pa. A3..89.50
Ensley,Ala. T2 .....84.50
Fairfield,Ala. T2 .....84.50
Fontana,Calif. K1 ....92.00
Gary,Ind. U5 .....84.50
Geneva,Utah C11 .....84.50
Houston S5 .....89.50
Johnstown,Pa. B2 ....84.50
Lackawanna,N.Y. B2..84.50
LosAngeles B3 .....94.00
Midland,Pa. C18 .....84.50
Munhall,Pa. U5 .....84.50
Pittsburgh J5 .....84.50
Seattle B3 .....98.00
S.Chicago R2,U5,W14 ..84.50
S.Duquesne,Pa. U5 ....84.50
S.SanFrancisco B3 ....94.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2, T7 ....96.00
Conshohocken,Pa. A3..103.00
Detroit R7 .....96.00
Fontana,Calif. K1 ....115.00
Gary,Ind. U5 .....96.00
Houston S5 .....101.00
Ind.Harbor,Ind. Y1 ...96.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....116.00
Massillon,O. R2 .....96.00
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
S.Chicago R2,U5,W14..96.00
S.Duquesne,Pa. U5 ....96.00
Struthers,O. Y1 .....96.00
Warren,O. C17 .....96.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$103.50
Canton,O. R2 .....103.50
Cleveland R2 .....103.50
Gary,Ind. U5 .....103.50
S.Chicago R2, W14 ....103.50
S.Duquesne,Pa. U5 ...103.50

SKELP
Aliquippa,Pa. J5 ....4.325
LoneStar,Tex. L6 ....4.625
Munhall,Pa. U5 .....4.225
SparrowsPoint,Md. B2..4.225
Warren,O. R2 .....4.225
Youngstown R2, U5 ...4.225

WIRE RODS
AlabamaCity,Ala. R2 ..5.025
Aliquippa,Pa. J5 .....5.025
Alton,Ill. L1 .....5.20
Buffalo B11, W12 ....5.025
Cleveland A7 .....5.025
Donora,Pa. A7 .....5.025
Fairfield,Ala. T2 .....5.025
Houston S5 .....5.275
IndianaHarbor,Ind. Y1.5.025
Johnstown,Pa. B2 ....5.025
Joliet,Ill. A7 .....5.025
KansasCity,Mo. S5 ....5.275
Kokomo,Ind. C16 ....5.125
LosAngeles B3 .....5.825
Minnequa,Colo. C10....5.275
Monessen,Pa. P7 .....5.025
N.Tonawanda,N.Y. B11..5.025
Pittsburg,Calif. C11 ...5.675
Portsmouth P12 .....5.025
Roebling,N.J. R5 .....5.125
S.Chicago,Ill. R2 .....5.025
SparrowsPoint,Md. B2..5.125
Sterling,Ill.(1) N15 ....5.025
Sterling,Ill. N15 .....5.125
Struthers,O. Y1 .....5.025
Worcester,Mass. A7 ...5.325

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 .....4.60
Aliquippa,Pa. J5 .....4.60
Bessemer,Ala T2 .....4.60
Bethlehem,Pa. B2 .....4.65
Birmingham C15 .....4.60
Clairton,Pa. U5 .....4.60
Fairfield,Ala. T2 .....4.60
Fontana,Calif. K1 .....5.25
Gary,Ind. U5 .....4.60
Geneva,Utah C11 .....4.60
Houston S5 .....4.70
Ind.Harbor,Ind. I-2 ....4.60
Johnstown,Pa. B2 .....4.65
KansasCity,Mo. S5 ....4.70
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.30
Minnequa,Colo. C10 ....4.90
Munhall,Pa. U5 .....4.60
Niles,Calif. P1 .....4.90
Portland,Oreg. O4 ....5.35
Phoenixville,Pa. P4 ....5.15
Seattle B3 .....5.35
S.Chicago U5, W14 .....4.60
S.SanFrancisco B3 ....5.25
Torrance,Calif. C11 ....5.30
Weirton,W.Va. W6 ....4.60

Wide Flange
Bethlehem,Pa. B2 ....4.65
Clairton,Pa. U5 .....4.60
Fontana,Calif. K1 ....5.40
Lackawanna,N.Y. B2 ...4.65
Munhall,Pa. U5 .....4.60
Phoenixville,Pa. P4 ....5.15
S.Chicago,Ill. U5 .....4.60

Alloy Std. Shapes
Clairton, Pa. U5 .....5.65
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....5.65
Houston S5 .....5.75
Munhall,Pa. U5 .....5.65
S.Chicago,Ill. U5 .....5.65

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....6.75
Bessemer,Ala. T2 .....6.75
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.75
Fairfield,Ala. T2 .....6.75
Fontana,Calif. K1 ....7.40
Gary,Ind. U5 .....6.75
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1.6.75
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 ....6.85
Lackawanna,N.Y. B2 ..6.80
LosAngeles B3 .....7.45
Munhall,Pa. U5 .....6.75
Seattle B3 .....7.50
S.Chicago,Ill. U5, W14..6.75
S.SanFrancisco B3 ....7.40
Struthers,O. Y1 .....6.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....6.80
Lackawanna,N.Y. B2 ...6.80
Munhall,Pa. U5 .....6.75
S.Chicago,Ill. U5 .....6.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....4.65
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
S.Chicago,Ill. U5 .....4.60

STEEL SHEET PILING
Ind.Harbor,Ind. I-2 ....5.45
Lackawanna,N.Y. B2 ...5.45
Munhall,Pa. U5 .....5.45
S.Chicago,Ill. U5 .....5.45

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....4.50
Aliquippa,Pa. J5 .....4.50
Ashland,Ky.(15) A10 ...4.50
Bessemer,Ala. T2 .....4.50
Bridgeport,Conn. N19 ..4.75
Buffalo R2 .....4.50
Clairton,Pa. U5 .....4.50
Claymont,Del. C22 .....4.50
Cleveland J5, R2 .....4.60
Coatesville,Pa. L7 .....4.50
Conshohocken,Pa. A3 ..4.50
Detroit M1 .....4.60
Ecorse,Mich. G5 .....4.60
Fairfield,Ala. T2 .....4.50
Fontana,Calif.(30) K1 ..5.15
Gary,Ind. U5 .....4.50
Geneva,Utah C11 .....4.50
GraniteCity,Ill. G4 ....4.70
Harrisburg,Pa. C5 ....5.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1.4.50
Johnstown,Pa. B2 .....4.50
Lackawanna,N.Y. B2 ...4.50
LoneStar,Tex. L6 .....4.85
Mansfield,O. E6 .....4.50
Minnequa,Colo. C10 ....5.35
Munhall,Pa. U5 .....4.50
Newport,Ky. N9 .....4.50
Pittsburgh J5 .....4.50
Riverdale,Ill. A1 .....4.50
Seattle B3 .....5.40
Sharon,Pa. S3 .....4.50
S.Chicago R2, U5, W14.4.50
SparrowsPoint,Md. B2 ..4.50
Steubenville,O. W10 ....4.50
Warren,O. R2 .....4.50
Weirton,W.Va. W6 ....4.50
Youngstown R2, U5, Y1.4.50

PLATES, Carbon Abras. Resist.
Fontana,Calif. K1 ....6.30
Geneva,Utah C11 .....5.65
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron
Economy,Pa. B14 ....10.40

PLATES, High-Strength Low-Alloy
Aliquippa,Pa. J5 ....6.725
Bessemer,Ala. T2 ....6.725
Clairton,Pa. U5 .....6.725
Cleveland J5, R2 ....6.725
Coatesville,Pa. L7 ....6.725
Conshohocken,Pa. A3 ..6.725
Ecorse,Mich. G5 .....6.825
Fairfield,Ala. T2 .....6.725
Fontana,Calif.(30) K1..7.375
Gary,Ind. U5 .....6.725
Geneva,Utah C11 .....6.725
Houston S5 .....6.825
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 ....6.725
LosAngeles B3 .....7.625
Munhall,Pa. U5 .....6.725
Pittsburgh J5 .....6.725
Seattle B3 .....7.625
Sharon,Pa. S3 .....6.725
S.Chicago,Ill. U5, W14..6.725
SparrowsPoint,Md. B2..6.725
Youngstown U5, Y1 ...6.725

PLATES, Alloy
Bridgeport,Conn. N19 ...6.55
Claymont,Del. C22 ....6.30
Coatesville,Pa. L7 ....6.30
Fontana,Calif. K1 ....6.95
Gary,Ind. U5 .....6.30
Houston S5 .....6.40
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 ....6.30
Munhall,Pa. U5 .....6.30
Newport,Ky. N9 .....6.30
Seattle B3 .....7.20
Sharon,Pa. S3 .....6.30
S.Chicago,Ill. U5, W14..6.30
SparrowsPoint,Md. B2 ..6.30
Youngstown Y1 .....6.30

FLOOR PLATES
Cleveland J5 .....5.575
Conshohocken,Pa. A3 ..5.575
Harrisburg,Pa. C5 ....5.575
Ind.Harbor,Ind. I-2 ...5.575
Munhall,Pa. U5 .....5.575
S.Chicago,Ill. U5 .....5.575

PLATES, Ingot Iron
Ashland c.l. (15) A10...4.75
Ashland l.c.l (15) A10..5.25
Cleveland c.l. R2 .....5.10
Warren,O. c.l. R2 .....5.10

BARS

BARS, Hot-Rolled Carbon
Ala.City,Ala. R2 .....4.65
Aliquippa,Pa. J5 .....4.65
Alton,Ill. L1 .....4.85
Atlanta A11 .....4.85
Bessemer,Ala. T2 .....4.65
Birmingham C15 .....4.65
Bridgeport,Conn. N19 ..4.80
Buffalo R2 .....4.65
Canton,O. R2 .....4.75
Clairton,Pa. U5 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ...4.80
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.65
Houston S5 .....4.90
Ind.Harbor,Ind. I-2, Y1.4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....4.65
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.75
Midland,Pa. C18 .....4.65
Milton,Pa. M18 .....4.65
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.00
N.Tonawanda,N.Y. B11..4.65
Pittsburg,Calif. C11 ....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
Seattle B3, N14 .....5.40
S.Chicago R2, U5, W14..4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFran.,Calif. B3 ...5.40
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Warren,O. R2 .....4.65
Weirton,W.Va. W6 ....4.65
Youngstown R2, U5 ...4.65

BARS, H.R. Leaded Alloy
Warren,O. C17 .....6.325

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....5.575
Bridgeport,Conn. N19 ..5.725
Buffalo R2 .....5.575
Canton,O. R2, T7 ....5.575
Clairton,Pa. U5 .....5.575
Detroit R7 .....5.575
Ecorse,Mich. G5 .....5.675
Fontana,Calif. K1 .....6.625
FairlessHills,Pa. U5 ...5.725
Gary,Ind. U5 .....5.575
Houston S5 .....5.825
Ind.Harbor,Ind. I-2, Y1.5.575
Johnstown,Pa. B2 ....5.575
KansasCity,Mo. S5 ....5.825
LosAngeles B3 .....6.625
Massillon,O. R2 .....5.575
Midland,Pa. C18 .....5.575
S.Chicago R2, U5, W14.5.575
S.Duquesne,Pa. U5 ....5.575
Struthers,O. Y1 .....5.575
Warren,O. C17 .....5.575
Youngstown U5 .....5.575

BARS & SMALL SHAPES, H.R.
High-Strength Low-Alloy
Aliquippa,Pa. J5 .....6.80
Bessemer,Ala. T2 .....6.80
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.80
Cleveland R2 .....6.80
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....6.80
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
Ind.Harb.,Ind. I-2, Y1 ..6.80
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 ....7.05
Lackawanna,N.Y. B2 ...6.80
LosAngeles B3 .....7.50
Pittsburgh J5 .....6.80
Seattle B3 .....7.55
S.Chicago W14 .....6.80
S.Duquesne,Pa. U5 ....6.80
S.SanFrancisco B3 ....7.55
Struthers,O. Y1 .....6.80
Warren,O. R2 .....6.80
Youngstown U5 .....6.80

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa. B2 .....4.80

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....4.65
Atlanta A11 .....4.85
Fontana,Calif. K1 .....5.35
Niles,Calif. P1 .....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 ....5.05
SanFrancisco S7 .....5.05

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....5.65
Gary,Ind. U5 .....5.65
Houston S5 .....5.90
KansasCity,Mo. S5 ....5.90
Youngstown U5 .....5.65

BARS, C.F. Loaded Alloy
Ambridge,Pa. W18 ...8.325
Camden,N.J. P13 .....8.50
Chicago W18 .....8.325
Cleveland C20 .....8.325
Monaca, Pa. S17 ....8.325
Newark,N.J. W18 .....8.50
SpringCity,Pa. K3 ....8.50
Warren,O. C17 .....8.325

BARS, Cold-finished Carbon
Ambridge,Pa. W18 ....5.90
BeaverFalls,Pa. M12,R2.5.90
Buffalo B5 .....5.95
Camden,N.J. P13 .....6.35
Carnegie,Pa. C12 .....5.90
Chicago W18 .....5.90
Cleveland A7, C20 ....5.90
Detroit R7 .....5.90
Detroit B5, P17 .....6.10
Donora,Pa. A7 .....5.90
Elyria,O. W8 .....5.90
FranklinPark,Ill. N5 ...5.90
Gary,Ind. R2 .....5.90
GreenBay,Wis. F7 .....5.90
Hammond,Ind. L2, M13.5.90
Hartford,Conn. R2 ....6.40
Harvey,Ill. B5 .....5.90
LosAngeles R2, S30 ....7.35
Mansfield,Mass. B5 ....6.45
Massillon,O. R2, R8 ....5.90
Midland,Pa. C18 .....5.90
Monaca,Pa. S17 .....5.90
Newark,N.J. W18 .....6.35
NewCastle,Pa.(17) B4 ...5.90
Pittsburgh J5 .....5.90
Plymouth,Mich. P5 ....6.15
Putnam,Conn. W18 ....6.45
Readville,Mass. C14 ....6.45
S.Chicago,Ill. W14 ....5.90
SpringCity,Pa. K3 ....6.35
Struthers,O. Y1 .....5.90
Waukegan,Ill. A7 .....5.90
Worcester,Mass. W19 ...6.35
Youngstown F3, Y1 ....5.90

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md. C19 ...5.15

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....7.425
BeaverFalls,Pa.M12,R2 7.425
Bethlehem,Pa. B2 .....7.425
Buffalo B5 .....7.425
Camden,N.J. P13 .....7.60
Canton,O. T7 .....7.425
Carnegie,Pa. C12 .....7.425
Chicago W18 .....7.425
Cleveland A7, C20 ....7.425
Detroit R7 .....7.425
Detroit B5, P17 .....7.625
Donora,Pa. A7 .....7.425
Elyria,O. W8 .....7.425
Gary,Ind. R2 .....7.425
GreenBay, Wis. F7 ...7.425
Hammond,Ind. L2, M13.7.425
Hartford,Conn. R2 ....7.725
Harvey,Ill. B5 .....7.425
Lackawanna,N.Y. B2 ...7.425
LosAngeles S30 .....9.10
Mansfield,Mass. B5 ....7.725
Massillon,O. R2, R8 ....7.425
Midland,Pa. C18 .....7.425
Monaca,Pa. S17 .....7.425
Newark,N.J. W18 .....7.60
Plymouth,Mich. P5 ....7.625
S.Chicago W14 .....7.425
SpringCity,Pa. K3 .....7.60
Struthers,O. Y1 .....7.425
Warren,O. C17 .....7.425
Waukegan,Ill. A7 .....7.425
Worcester,Mass. A7 ....7.725
Youngstown F3, Y1 ....7.425

BARS, Reinforcing
(To Fabricators)
Ala.City,Ala. R2 .....4.65
Atlanta A11 .....4.85
Birmingham C15 .....4.65
Buffalo R2 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ...5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ...4.80
Fontana,Calif. K1 .....5.35
Ft.Worth,Tex.(42) T4 ...5.10
Gary,Ind. U5 .....4.65
Houston S5 .....4.90

Ind.Harbor,Ind. I-2, Y1.4.65
Johnstown,Pa. B2 ....4.65
Joliet,Ill. P22 .....4.65
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.35
Milton,Pa. M18 .....4.65
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.00
Pittsburg,Calif. C11 ....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
SandSprings,Okla. S5 ..5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFrgsco B3 ....5.40
SparrowsPoint,Md. B2 ..4.65
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Youngstown R2, U5, Y1.4.65

BARS, Reinforcing (Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2.6.15
KansasCity,Kans. S5 ...6.45
Lackawanna,N.Y. B2 ..6.17
Marion,O. P11 .....5.90
Pittsburgh U8 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ½-1" B2 ..6.15
Williamsport,Pa. S19 ..6.00

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.55
ChicagoHts.(4) C2, I-2..4.65
Ft.Worth,Tex.(26) T4 ..4.95
Franklin,Pa.(3) F5 ....4.55
Franklin,Pa.(4) F5 ....4.65
Marion,O.(3) P11 .....4.50
Moline,Ill.(3) R2 .....4.65
Tonawanda(3) B12 ....4.50
Tonawanda(4) B12 ....4.65
Williamsport,Pa.(3) S19.4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt)B14 14.65
McK.Rks.(S.R.) L5 ...11.50
McK.Rks.(D.R.) L5 ...16.00
McK.Rks.(Staybolt) L5.17.00

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ...4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit(8) M1 .....4.425
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 ....4.325
FairlessHills,Pa. U5 ...4.375
Fontana,Calif. K1 .....5.075
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.525
Ind.Harbor,Ind. I-2, Y1.4.325
Kokomo,Ind. C16 .....4.425
Lackawanna,N.Y. B2 ..4.325
Mansfield,O. E6, (37)..4.325
Munhall,Pa. U5 .....4.325
Newport,Ky.(8) N9 ....4.325
Niles,O. N12 .....4.325
Pittsburg,Calif. C11 ...5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 .....4.325
Riverdale,Ill. A1 .....4.325
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 .....4.325
SparrowsPoint,Md. B2.4.325
Steubenville,O. W10 ....4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 .....4.325
Youngstown U5, Y1 ..4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.625
Kokomo,Ind. C16 .....5.475
Niles,O. N12 .....5.325

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....7.20
Youngstown Y1 .....7.20

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 ....6.375
Conshohocken,Pa. A3 ..6.425
Dravosburg,Pa. U5 ....6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 ....6.375
FairlessHills,Pa. U5 ..6.425
Fontana,Calif. K1 ....7.125
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1 6.375
Lackawanna(35) B2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill. U5 .....6.375
SparrowsPoint(36) B2.6.375
Warren,O. R2 .....6.375
Weirton,W.Va. W6 ....6.375
Youngstown U5, Y1 ...6.375

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.575
Cleveland R2 .....4.925
Ind.Harbor,Ind. I-2 ...4.575
Warren,O. R2 .....4.925

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.375
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 ....5.325
FairlessHills,Pa. U5 ...5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 ....6.425
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ...5.525
Ind.Harbor,Ind. I-2, Y1 5.325
Lackawanna,N.Y. B2 ..5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 ....5.325
Newport,Ky. N9 .....5.325
Pittsburg,Calif. C11 ..6.275
Pittsburgh J5 .....5.325
Portsmouth,O. P12 ....5.325
SparrowsPoint,Md. B2..5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.325
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 ....7.875
Dravosburg,Pa. U5 ....7.875
Ecorse,Mich. G5 .....7.975
FairlessHills,Pa. U5 ..7.925
Fontana,Calif. K1 ....8.975
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1.7.875
Lackawanna(37) B2 ..7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2 .7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.925
Middletown,O. A10 ....5.825
Warren,O. R2 .....5.925

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky A10	6.90	...
Canton,O. R2	6.10	6.55
Dravosburg U5	6.10	...
Fairfield T2	6.10	...
Gary,Ind. U5	6.10	6.35
Ind.Harbor I-2	6.10	6.35
Kokomo,Ind. C16	6.20	...
MartinsFry. W10	6.10	...
Newport,Ky N9	6.10	6.35
Pitts.,Calif. C11	6.85	...
SparrowsPt. B2	6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....7.15
Gary,Ind. U5 .....6.35
MartinsFry.O, W10 ....6.35

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 .....5.85‡
Ashland,Ky. A10 ....5.85†
Canton,O. R2 .....5.85‡
Delphos,O. N16 .....6.60‡
Dover, O. R1 .....5.85‡
Dravosburg,Pa. U5 ...5.85†
Fairfield,Ala. T2 ....5.85†
Gary,Ind. U5 .....5.85*
GraniteCity, Ill. G4 ...6.05
Ind.Harbor,Ind. I-2 ....5.85†
Kokomo,Ind. C16 ....5.95‡
MartinsFerry,O. W10 ..5.85*
Middletown,O. A10 ....5.85†
Newport,Ky. N9 .....5.85‡
Niles,O. N12 .....5.85‡
Pittsburg,Calif. C1 ....6.60*
SparrowsPt.,Md. B2 ....5.85†
Steubenville,O. W10 ...5.85‡
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ....5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 ....6.575

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.60
SparrowsPoint(39) B2 ..8.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.25
Dravosburg,Pa. U5 ....6.25
Kokomo,Ind. C16 .....6.60
Newport,Ky. N9 .....6.25
Niles,O. N12 .....7.25

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.10
Canton,O. R2 .....6.60
Middletown,O. A10 ....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 ....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.50
Butler,Pa. A10 (type 2).8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.10
Ind.Harbor,Ind. I-2 ....5.90
Middletown,O. A10 ....5.90
Niles,O. N12 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...7.75
Ind.Harbor,Ind. I-2 ....7.75
Yorkville,O. W10 ....7.75

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....6.25
Niles,O. N12 .....6.25
Weirton,W.Va. W6 ....6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.65

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A6 American Shim Steel Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Frets-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins,E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine & Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb.Wire
N9 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W.Co.
N16 New Delphos Mfg.Co.
N19 Northeastern Steel Corp.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Products
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division. Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division, H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Alliesport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.325
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.375
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.075
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2, Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles(25) B3	5.075
Milton,Pa. M18	4.325
Minnequa,Colo. C10	5.425
NewBritain(10) S15	4.325
N.Tonawanda,N.Y. B11	4.325
Pittsburg,Calif. C11	5.075
Portsmouth,O. P12	4.325
Riverdale,Ill. A1	4.325
SanFrancisco S7	5.05
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S.Chicago,Ill. W14	4.325
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren,O. R2	4.325
Weirton,W.Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	8.85
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.20
Sharon,Pa. S3	7.20
S.Chicago W14	7.20
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.425
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	7.525
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2, Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren,O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575
Warren,O. R2	4.925

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland J5	6.45
Cleveland A7	6.25
Conshohocken,Pa. A3	6.30
Dearborn,Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover,O. G6	6.25
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.00
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y1	6.45
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.50
NewBedford,Mass. R10	6.70
NewBritain(10) S15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7	7.00
NewHaven,Conn. D2	6.70
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.45
Portsmouth,O. P12	6.25
Riverdale,Ill. A1	6.35
Rome,N.Y.(32) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2 T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	7.10
Youngstown Y1	6.45
Youngstown C8	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.30	9.25	10.80	12.95	15.65
Boston T6	7.55	9.25	10.80	12.95	15.65
Bristol,Conn. W1	...	...	10.80	12.95	....
Carnegie,Pa. S18	...	8.95	10.50	12.65	....
Cleveland A7	7.00	8.95	10.50	12.65	15.35
Cleveland C7	...	8.95	10.50	12.65	15.35
Dearborn,Mich. D3	7.10	9.05	10.60	....	....
Detroit D2	7.10	9.05	10.60	12.75	....
Dover,O. G6	7.00	8.95	10.50	12.65	15.35
Follansbee,W.Va. F4	7.00	8.95	10.50**	....	....
FranklinPark,Ill. T6	7.10	8.95	10.50	12.65	15.35
Harrison,N.J. C18	...	...	10.80	12.95	15.65
Indianapolis C8	7.15	9.10	10.50	12.65	15.35
NewBritain,Conn.(10) S15	7.00	8.95	10.50	12.65	15.35
NewCastle,Pa. B4, E5	7.00	8.95	10.50	12.65	....
NewHaven,Conn. D2	7.45	9.25	10.80	12.95	....
NewKensington,Pa. A6	7.00	8.95	10.50	....	....
New York W3	...	...	10.80	12.95	15.65
Pawtucket,R.I. N8	7.55	9.25	10.80	12.95	15.35
Riverdale,Ill. A1	7.10	8.95	10.50	12.65	15.35
Rome,N.Y.(32) R6	7.00	8.95	10.50	12.65	15.35
Sharon,Pa. S3	7.00	8.95	10.50	12.65	15.35
Trenton,N.J. R5	...	9.25	10.80	12.95	15.65
Wallingford,Conn. W2	7.45	9.25	10.80	12.95	15.65
Warren,O. T5	7.00	8.95	10.50	12.65	15.35
Weirton,W.Va. W6	7.00	8.95	10.50	12.65	15.35
Worcester,Mass. T6	7.55	9.25	10.80	12.95	15.65
Worcester,Mass. A7	7.55	9.25	10.80	12.95	15.65
Youngstown C8	7.00	8.95	10.50	12.65	15.35

**0.065 C, max.

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	14.40	17.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	14.90	18.10	21.50
Harrison,N.J. C18	...	...	14.40	17.60	21.00
NewYork W3	...	...	14.40	17.60	21.00
Trenton,N.J. R5	...	...	14.40	17.60	21.00
Worcester,Mass. A7, T6	...	...	14.40	17.60	21.00
Worcester,Mass. W12	...	...	14.40	....	....
Youngstown C8	...	...	14.75	17.95	21.35

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. N12	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	....	10.10†	10.70†	11.70†	12.60†
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60
Zanesville,O. A10	....	10.10	10.70	11.70	12.60

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80‡	13.35‡	13.85‡	14.85‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	13.55‡
Butler,Pa. A10	....	....	17.45	17.95	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	13.55
Warren,O. R2	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. ‡Coils, ¾-cent higher.

Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2 T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	7.10
Youngstown Y1	6.45
Youngstown C8	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.30	9.25	10.80	12.95	15.65
Boston T6	7.55	9.25	10.80	12.95	15.65
Bristol,Conn. W1	...	...	10.80	12.95	....
Carnegie,Pa. S18	...	8.95	10.50	12.65	....
Cleveland A7	7.00	8.95	10.50	12.65	15.35
Cleveland C7	...	8.95	10.50	12.65	15.35
Dearborn,Mich. D3	7.10	9.05	10.60	....	....
Detroit D2	7.10	9.05	10.60	12.75	....
Dover,O. G6	7.00	8.95	10.50	12.65	15.35
Follansbee,W.Va. F4	7.00	8.95	10.50**	....	....
FranklinPark,Ill. T6	7.10	8.95	10.50	12.65	15.35
Harrison,N.J. C18	...	...	10.80	12.95	15.65
Indianapolis C8	7.15	9.10	10.50	12.65	15.35
NewBritain,Conn.(10) S15	7.00	8.95	10.50	12.65	15.35
NewCastle,Pa. B4, E5	7.00	8.95	10.50	12.65	....
NewHaven,Conn. D2	7.45	9.25	10.80	12.95	....
NewKensington,Pa. A6	7.00	8.95	10.50	....	....
New York W3	...	...	10.80	12.95	15.65
Pawtucket,R.I. N8	7.55	9.25	10.80	12.95	15.35
Riverdale,Ill. A1	7.10	8.95	10.50	12.65	15.35
Rome,N.Y.(32) R6	7.00	8.95	10.50	12.65	15.35
Sharon,Pa. S3	7.00	8.95	10.50	12.65	15.35
Trenton,N.J. R5	...	9.25	10.80	12.95	15.65
Wallingford,Conn. W2	7.45	9.25	10.80	12.95	15.65
Warren,O. T5	7.00	8.95	10.50	12.65	15.35
Weirton,W.Va. W6	7.00	8.95	10.50	12.65	15.35
Worcester,Mass. T6	7.55	9.25	10.80	12.95	15.65
Worcester,Mass. A7	7.55	9.25	10.80	12.95	15.65
Youngstown C8	7.00	8.95	10.50	12.65	15.35

**0.065 C, max.

Spring Steel (Tempered)

Bristol,Conn. W1	...	...	14.40	17.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	14.90	18.10	21.50
Harrison,N.J. C18	...	...	14.40	17.60	21.00
NewYork W3	...	...	14.40	17.60	21.00
Trenton,N.J. R5	...	...	14.40	17.60	21.00
Worcester,Mass. A7, T6	...	...	14.40	17.60	21.00
Worcester,Mass. W12	...	...	14.40	....	....
Youngstown C8	...	...	14.75	17.95	21.35

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Dravosburg,Pa. U5	7.50	7.75	8.15
Fairfield,Ala. T2	7.60	7.85	8.25
FairlessHills,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton, W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.675	6.875	7.075

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	8.80	$9.05
Dravosburg,Pa. U5	8.80	9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.05
Ind.Har. I-2, Y1	8.80	9.05
Pitts.,Calif. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.60
Dravosburg,Pa. U5	6.60
Fairfield,Ala. T2	6.70
FairlessHills,Pa. U5	6.70
Gary,Ind. U5	6.60
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2, Y1	6.60
Niles,O. R2	6.60
Pittsburg,Calif. C11	7.35

SparrowsPoint,Md. B2	6.70
Warren,O. R2	6.60
Weirton,W.Va. W6	6.60
Yorkville,O. W10	6.60

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.65
Gray,Ind. U5	6.65
GraniteCity,Ill. G4	6.75
Ind.Harbor,Ind. Y1	6.65
Yorkville,O. W10	6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$7.85
Gray,Ind. U5	7.85

MANUFACTURING TERNES (Light Coated, 8 lb; Base Box)

Yorkville,O. W10	$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R3	6.25
Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.425
Atlanta A11	6.45
Bartonville,Ill. K4	6.35
Buffalo W12	6.25
Chicago W13	6.25
Cleveland A7	6.25
Crawfordsville,Ind. M8	6.35
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fairfield,Ala. T2	6.25
Fostoria,O.(24) S1	6.45
Houston S5	6.50
Jacksonville,Fla. M8	6.77
Johnstown,Pa. B2	6.25
Joliet,Ill. A7	6.25
KansasCity,Mo. S5	6.50
Kokomo,Ind. C16	6.35
LosAngeles B3	7.20
Minnequa,Colo. C10	6.50
Monessen,Pa. P7	6.25
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Portsmouth,O. P12	6.25
Rankin,Pa. A7	6.25
S.Chicago,Ill. R2	6.25
S.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Sterling,Ill.(1) N15	6.25
Sterling,Ill. N15	6.35
Struthers,O. Y1	6.25
Waukegan,Ill. A7	6.25
Worcester,Mass. A7	6.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.85
Milbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	7.90
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Johnstown,Pa. B2	7.60
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa,Colo. C10	7.775
Monessen,Pa. P16	7.60
NewHaven,Conn. A7	7.90
Palmer,Mass. W12	7.90
Pittsburg,Calif. C11	8.55
Portsmouth,O. P12	7.60
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	7.60
S.SanFrancisco C10	8.55
SparrowsPoint,Md. B2	7.70
Struthers,O. Y1	7.60
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	13.08
Johnston,Pa. B2	12.55
Kokomo,Ind. C16	12.55
Minnequa,Colo. C10	12.30
Monessen,Pa. P16	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.55
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan,Ill. A7	12.55
Worcester,Mass. A7, T6	12.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa,Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Pittsburg,Calif. C11	11.50
Portsmouth,O. P12	10.70
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80

ROPE WIRE (A)

Bartonville,Ill. K4	10.55
Buffalo W12	10.55
Fostoria,O.(23) S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.55
Portsmouth,O. P12	9.75
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	9.00
Baltimore T6	9.30
Buffalo W12	9.00
Cleveland A7	9.00
Crawfordsville,Ind. M8	9.00
Dover,O. G6	9.00
Fostoria,O. S1	9.00
FranklinPark,Ill. T6	9.10
Kokomo,Ind. C16	9.00
Massillon,O. R8	9.00
Milwaukee C23	9.20
Monessen,Pa. P16	9.00
Pawtucket,R.I. N8	9.30
Riverdale,Ill. A1	9.10
Rome,N.Y. R6	9.00
Trenton,N.J. R5	9.30
Worcester A7, T6, W12	9.30

NAIL, Stock

To Dealers & Mfrs. (7) Col.	
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.05
Wheeling,W.Va. W10	9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7) Col.	
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.35
Bartonville,Ill. K4	9.45
Buffalo W12	9.35
Crawfordsville,Ind. M8	9.46
Donora,Pa. A7	9.35
Duluth,Minn. A7	9.35
Johnstown,Pa. B2	9.35
Joliet,Ill. A7	9.35
Kokomo,Ind. C16	9.45
LosAngeles B3	10.14
Minnequa,Colo. C10	9.60
Pittsburg,Calif. C11	10.43
S.Chicago,Ill. R2	9.35
SparrowsPt., Md. B2	9.45
Sterling,Ill. N15	9.35

Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.65
Bartonville,Ill. K4	9.75
Buffalo W12	9.60
Crawfordsville,Ind. M8	9.75
Donora,Pa. A7	9.65
Duluth,Minn. A7	9.65
Johnstown,Pa. B3	9.65
Joliet,Ill. A7	9.65
Kokomo,Ind. C16	9.75
LosAngeles B3	10.45
Minnequa,Colo. C10	9.90
Pittsburg,Calif. C11	10.13
S.Chicago,Ill. R2	9.65
SparrowsPt.,Md. B2	9.75
Sterling,Ill. N15	9.65

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.70
Bartonville,Ill. K4	9.80
Buffalo W12	9.70
Crawfordsville,Ind. M8	9.80
Donora,Pa. A7	9.70
Duluth,Minn. A7	9.70
Johnstown,Pa. B2	9.70
Joliet,Ill. A7	9.70
Kokomo,Ind. C16	9.80
LosAngeles B3	10.50
Minnequa,Colo. C10	9.95
Pittsburg,Calif. C11	10.50
S.Chicago,Ill. R2	9.70
SparrowsPt.,Md. B2	9.80
Sterling,Ill. N15	9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	175**
Aliquippa J5	172‡
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	175†
Duluth,Minn. A7	175†
Fairfield,Ala. T2	175†
Houston,Tex. S5	180†
Johnstown,Pa. B2	179*
Joliet,Ill. A7	175†
KansasCity,Mo. S5	180†
Kokomo,Ind. C16	177†
Minnequa,Colo. C10	180**
Monessen,Pa. P7	179*
Pittsburg,Calif. C11	195†
Rankin,Pa. A7	175†
S.Chicago,Ill. R2	175**
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	181*
Sterling,Ill.(1) N15	179*

WOVEN Fence, 9-15 Ga.

	Col.
Ala.City,Ala. R2	162**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Allq'ppa,Pa.9-14½ga J5	165‡
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	168
Donora,Pa. A7	162†
Duluth,Minn. A7	162†
Fairfield,Ala. T2	162†
Houston,Tex. S5	167†
Johnstown,Pa.(43) B2	166
Joliet,Ill. A7	162†
KansasCity,Mo. S5	167†
Kokomo,Ind. C16	164†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P17	166*
Pittsburg,Calif. C11	185†
Rankin,Pa. A7	162†
S.Chicago,Ill. R2	162**
Sterling,Ill.(1) N15	166*

WIRE (16 Gage)

	An'ld Stone	Galv. Stone
Ala.City R2	14.50	16.05**
Bartonville K4	14.60	16.50
Buffalo W12	14.50	----
Cleveland A7	14.50	----
Crawf'dsville M8	14.60	16.50
Fostoria,O. S1	14.60	16.15†
Johnstown B2	14.15	16.40*
Kokomo C16	14.60	16.15†
Minnequa C10	14.75	16.45**
Palmer,MassW12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.45††
Waukegan A7	14.50	16.05†
Worcester A7	14.80	----

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
Ala.City,Ala. R2	7.40	7.80**
Aliquippa J5	7.40	7.925‡
Atlanta A11	7.50	8.075
Bartonville(48) K4	7.50	8.075
Buffalo W12	7.40	8.80†
Cleveland A7	7.40	----
Crawfordsville M8	7.50	8.075
Donora,Pa. A7	7.40	7.80†
Duluth,Minn. A7	7.40	7.80†
Fairfield T2	7.40	7.80†
Houston,Tex. S5	7.65	8.05†
Jacksville,Fla.M8	7.90	8.475
Johnstown B2(48)	7.40	7.975*
Joliet,Ill. A7	7.40	7.80†
KansasCity,Mo. S5	7.65	8.05†
Kokomo C16	7.50	7.90†
LosAngeles B3	8.35	8.925*
Minnequa C10	7.65	8.05**
Monessen P7 (48)	7.40	7.975*
Palmer,Mass. W12	7.70	8.10†
Pitts.,Calif., C11	8.35	8.75†
Portsmouth,O. P12	7.40	----
Rankin A7	7.40	7.80†
S.Chicago R2	7.40	7.80**
S.SanFran. C10	8.35	8.75**
Spar'wsPt.B2(48)	7.50	8.075*
Str'ling(1)(48)	N15 7.40	8.00††
Struthers,O.(48)	Y1 7.40	7.90‡
Worcester,Mass.	A7 7.70	----

*Based on 12.50c zinc; †5c zinc; ‡10c zinc; ‡‡Less than 10c zinc; **Subject to zinc equalization extras. ††13c zinc.

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	157
Duluth,Minn. A7	157
Franklin,Pa. F5	157
Huntington,W.Va. W7	157
Johnstown,Pa. B2	160
Marion,O. P11	157
Minnequa,Colo. C10	162
Moline,Ill. R2	162
S.Chicago,Ill. R2	157
Tonawanda,N.Y. B12	157
Williamsport,Pa. S10	160

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS
(Base discounts, less case lots, per cent off list, f.o.b. midwestern plants)

4" and shorter:	
½" & smaller diam.	+ 5
Over 4" through 6":	
½" and smaller diam.	+ 12
6" and shorter:	
⅞" and ⅝"	+ 13
¾" and larger	+ 16
Longer than 6":	
All diameters	+ 25
Lag bolts, all diams:	
6" and shorter	+ 2
Over 6" long	+ 11
Ribbed Necked Carriage	+ 13
Blank	2
Plow	18
Step, Elevator, Tap and Sleigh Shoe	2
Tire Bolts	12
Boiler & Fitting-Up Bolts	14

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	51
H.P., Hex. regular & heavy:	
¾" and smaller	55
⅞" to 1½", inclusive	55
1¼" to 1½", inclusive	57
1⅝" and larger	51
C.P. Hex regular & heavy:	
¾" and smaller	55
Larger than ¾"	51
Hot Galv. Nuts (all types):	
¾" or smaller	38
⅞" to 1½", inclusive	36
Finished Hex Nuts:	
¾" and smaller	55
⅞" and larger	51
Semifinished & Slotted Hex:	
Regular and heavy, ¾" and smaller	55
⅞" and larger	51

STEEL STOVE BOLTS
(F.o.b. plant, per cent off list in packages; plain finish)

3" and shorter:	
⅛" thru ¼" diam, 25,000 to 200,000 pieces	61
Over 200,000 pieces	64
5/16" thru ⅜" diam: 15,000 to 100,000 pieces	61
100,000 or more	64
Longer than 3", any diam: 5000 to 100,000 pieces	61
Over 100,000 pieces	64

SQUARE HEAD SET SCREWS
(1035 steel; packaged; per cent off list)

1" diam x 6" and shorter	19
1" and smaller diam x over 6"	List

HEXAGON CAP SCREWS
(1020 steel; packaged; per cent off list)

6" or shorter:	
⅛" through ½"	34
9/16" & ⅝" & shorter	31
¾", ⅞" through 1 in.	8

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.06	20.41
1¼	13	....	24.94	20.44
1½	13	23.31	27.57	22.60
1⅝	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2¼	13	34.77	41.12	33.72
2½	12	37.73	44.63	36.59
2⅝	12	41.57	49.16	40.31
2¾	12	45.00	53.22	43.65
3	12	47.99	56.76	46.54

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Too Rolls 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	...	5.65
Fairfield,Ala. T2	...	...	...	5.65
Gary,Ind. U5	4.725	...	...	...
Huntington,W.Va. W7	...	...	...	5.65
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	...
Johnstown,Pa. B2	...	...	...	(16)5.65
Lackawanna,N.Y. B2	4.725	4.625	...	5.65
Minnequa,Colo. C10	4.725	4.625	...	6.15
Steelton,Pa. B2	4.725	4.625	...	...
Williamsport,Pa. S19	...	...	...	5.65

TIE PLATES

Fairfield,Ala. T2	5.625
Gary,Ind. U5	5.625
Ind.Harbor,Ind. I-2	5.625
Lackawanna,N.Y. B2	5.625
Minnequa,Colo. C10	5.625
Seattle B3	5.775
Steelton,Pa. B2	5.625
Torronce,Calif. C11	5.775

TRACK BOLTS (20) Treated

Cleveland R2	12.40
KansasCity,Mo. S5	12.40
Lebanon,Pa. B2	12.40
Minnequa,Colo. C10	12.40
Pittsburgh O3, P14	12.40
Seattle B3	12.90

AXLES

Ind.Harbor,Ind. S13	7.25
Johnstown,Pa. B2	7.25

JOINT BARS

Bessemer,Pa. U5	5.825
Fairfield,Ala. T2	5.825
Ind.Harbor,Ind. I-2	5.825
Joliet,Ill. U5	5.825
Lackawanna,N.Y. B2	5.825
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	5.825

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.90
Ind.Harbor,Ind. I-2, Y1	7.90
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	7.90
Minnequa,Colo. C10	7.90
Pittsburgh J5	7.90
Seattle B3	8.40
S.Chicago,Ill. R2	7.90
Struthers,O. Y1	7.90
Youngstown R2	7.90

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98 + % Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N. Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N.J., in bags	9.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	21.00
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	32.50
Unannealed (99 + % Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, frght. allowed	
Carlots	32.20
Ton lots	34.20
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	39.00-49.00†
Bronze, 5000-lb lots	58.00-61.50†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	94.00
Nickel-Silver, 5000-lb lots	53.25-60.00†
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	94.00
Stainless Steel, 316	$1.25
Tin	14.50*
Zinc, 5000-lb lots	18.25-32.90‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.50
Less than 1000 lb	4.65
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago Base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Deld San Francisco Bay area.
(23) Mild plow, 10.55c.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.10c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon, add 0.40c for alloy and 0.45c H.S.-L.A.
(31) Widths over ⅝-in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(33) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(48) 6-7 Ga.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Ambridge, Pa. N2	6.5	..	10.5	...	13	...	14.5	...	14.5	...	14	...	16.5	...
Lorain, O. N3	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25
Youngstown Y1	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+10	10.5	+7.25	13	+4.75	14.5	+3.25	14.5	+3.25	14	+3.75	16.5	+1.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Alton, Ill. L1	...	...	....	....	....	....	15.5	+1.75	18.5	2.25	21	5.75	23.5	7
Benwood, W. Va. W10	16.5	+12	7.25	+18.25	+1.75	+26.25	17.5	0.25	20.5	4.75	23	7.75	25.5	7
Butler, Pa. F6	17.5	+11	9	+16.5	0.5	+24	...	...	...	...	...	...	...	...
Etna, Pa. N2	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Fairless Hills, Pa. N3	...	...	....	....	....	....	15.5	+1.75	18.5	2.75	21	5.75	23.5	7
Fontana, Calif. K1	...	...	....	....	....	....	6	+11.25	9	+7.25	11.5	+3.75	14	+2.5
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	16.5	+0.75	19.5	3.25	22	6.75	24.5	8
Lorain, O. N3	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sharon, Pa. S4	17.5	+11	9	+16.5	0.5	+24	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Sparrows Pt., Md. B2	23	+ 5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	17.5	0.25	20.5	4.25	23	7.75	25.5	9
Wheatland, Pa. W9	17.5	+11	9	+16.5	0.5	+24	17.5	0.25	20.5	4.25	23	7.75	25.5	9

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	26	10	26.5	10.5	28	10.75	28	10.75	....	....	....	....
Alton, Ill. L1	24	8	24.5	8.5	26	8.75	26	8.75	....	....	....	....
Benwood, W. Va. W10	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Etna, Pa. N2	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Fairless Hills, Pa. N3	24	8	24.5	8.5	26	8.75	26	8.75	16.5	+1.25	16.5	+1.25
Fontana, Calif. K1	14.5	+1.5	15	+1	16.5	+0.75	16.5	+0.75	7	+10.75	7	+10.75
Ind. Harbor, Ind. Y1	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Lorain, O. N3	26	10	26.5	10.5	28	10.75	28	10.75	....	....	....	....
Sharon, Pa. M6	26	10	26.5	10.5	28	10.75	28	10.75	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75
Wheatland, Pa. W9	26	10	26.5	10.5	28	10.75	28	10.75	18.5	0.75	18.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. Bars; H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
201	17.00	21.50	....	....	31.00	....	....	42.25	39.00
202	18.25	24.00	31.00	36.25	33.50	36.75	38.75	42.50	42.50
301	17.75	22.25	....	36.75	32.00	38.00	....	44.25	41.00
302	19.00	24.75	32.00	37.25	34.50	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	41.00	....	....	....
304	20.25	26.00	33.75	39.00	37.25	40.25	43.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	45.25	48.00	52.25	52.25
305	21.75	28.25	....	39.50	40.25	40.25	43.50	50.25	50.25
308	22.00	29.00	38.50	44.25	41.25	45.50	49.75	52.00	52.00
309	29.50	38.25	46.75	53.50	53.50	54.75	58.25	67.00	67.00
309S	31.50	41.00	51.00	59.00	58.50	60.25	63.75	74.00	74.00
310	37.25	48.00	62.25	72.25	68.50	73.50	75.25	78.75	78.75
314	....	....	....	....	....	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.75	63.25	65.75	69.25	73.25	73.25
317	37.25	48.25	62.75	72.75	73.50	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	34.00	36.25	....	44.00
405	17.50	23.00	26.75	31.00	32.25	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	31.00	....	....	....
420	23.50	30.25	31.00	36.00	37.75	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	31.50	....	....	....
431	16.00	20.50	26.50	30.50	29.75	31.50	33.00	38.00	38.00
446	....	....	35.50	40.50	53.25	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	....	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	69.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled 10%	Strip, Carbon Base, Cold Rolled Both Sides
Copper*	30.00	38.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular carbon	0.275	5%Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.090
18.25	4.25	1	4.75	...	2.305-2.475
18	4	2	9	...	2.675-2.6775
18	4	2	....	...	1.765
18	4	1	....	...	1.600
13.75	3.75	2	5	...	2.245
13.5	4	3	....	...	1.865
9	3.5	...	....	...	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
AlabamaCity,Ala. R2	54.50	55.00‡	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00	....
Woodward,Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	58.50	59.00	59.50	60.00
Tonawanda,N.Y. W12	58.50	59.00	59.50	60.00
N.Tonawanda,N.Y. T9	....	59.00	59.50	60.00
Boston, deld.	69.15	69.65	70.15	....
Rochester,N.Y. deld.	61.52	62.02	62.52	....
Syracuse,N.Y. deld.	62.62	63.12	63.62	....
Chicago District				
Chicago I-3	58.50	59.00	59.00	59.50
Gary,Ind. U5	58.50	....	59.00	....
S.Chicago R2	58.50	....	59.00	....
S.Chicago,Ill. Y1	58.50	59.00	59.00	59.50
S.Chicago,Ill. U5, W14	58.50	....	59.00	59.50
Milwaukee, deld.	60.67	61.17	61.17	61.67
Muskegon,Mich. deld.	....	65.30	65.30	....
Cleveland District				
Cleveland A7, R2	58.50	59.00	59.00	59.50
Akron,O., deld.	61.25	61.75	61.75	62.25
Lorain,O. N3	58.50	....	....	59.50
Mid-Atlantic District				
Bethlehem,Pa. B2	60.50	61.00	61.50	62.00
NewYork, deld.	....	64.78	65.28	....
Newark, deld.	63.52	64.02	64.52	65.02
Birdsboro,Pa. B10	60.50	61.00	61.50	62.00
Chester,Pa. C31	54.50	55.00	55.50	....
Philadelphia, deld.	56.16	56.66	57.16	....
Steelton,Pa. B2	60.50	61.00	61.50	62.00
Swedeland,Pa. A3	60.50	61.00	61.50	62.00
Philadelphia, deld.	62.16	62.66	63.16	63.66
Troy,N.Y. R2	60.50	61.00	61.50	62.00
Pittsburgh District				
NevilleIsland,Pa. P6	58.50	59.00	59.00	....
Pittsburgh (N&S sides), Aliquippa, deld.	....	60.37	60.37	60.87
McKeesRocks, deld.	....	60.04	60.04	60.54
Lawrenceville,Homestead, Wilmerding,Monaca, deld.	....	60.66	60.66	61.16
Verona,Trafford, deld.	60.69	61.19	61.19	61.69
Brackenridge, deld.	60.95	61.45	61.45	61.95
Bessemer Pa. U5	58.50	....	59.00	59.50
Clairton,Rankin,S.Duquesne,Pa. U5	58.50	....	....	....
McKeesport,Pa. N3	58.50	....	....	59.50
Midland,Pa. C18	58.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	59.00	....
Sharpsville,Pa. S6	58.50	....	59.00	59.50
Youngstown Y1	....	....	59.00	59.50
Youngstown U5	58.50	....	....	59.50
Mansfield,O., deld.	63.40	....	63.90	64.40
Duluth I-3	58.50	59.00	59.00	59.50
Erie,Pa. I-3	58.50	59.00	59.00	59.50
Everett,Mass. E1	60.50	61.00	61.50	....
Fontana,Calif. K1	64.50	65.00	....	....
Geneva,Utah C11	58.50	59.00	....	....
GraniteCity,Ill. G4	60.40	60.90	61.40	....
Ironton,Utah C11	58.50	59.00	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	60.50	61.00	61.50	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	58.50	59.00	59.00	59.50
Cincinnati, deld.	64.26	64.76	....	....

*Phos. 0.51-0.75%; $56. Phos. 0.31-0.50%.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$67.50
Buffalo H1	68.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$80.50
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	87.50
Keokuk, O.H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	90.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$72.50
Steelton,Pa. B2 (Phos. 0.035% max)	66.50
Philadelphia, deld.	70.05
Troy,N.Y. R2 (Phos. 0.035% max)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50

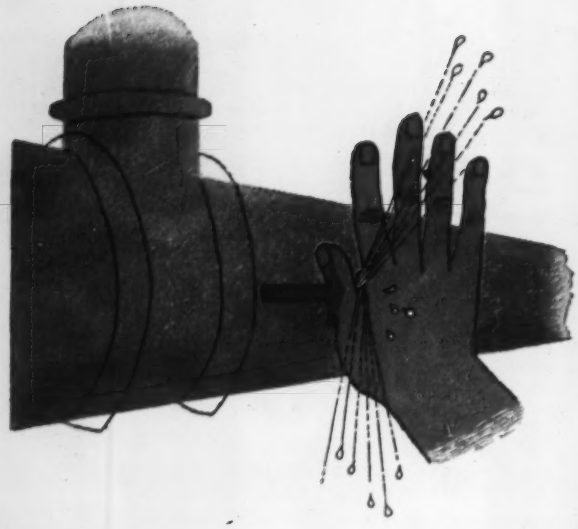
Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 25 cents per 100 lb except: Buffalo, Cleveland, Erie, 30 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Birmingham, Chattanooga, Jackson, 15 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.§	H.R. Alloy 4140††‖		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	....	7.42	9.39	....	7.63	7.49	9.48
Baltimore	7.03	8.32	9.10	....	7.65	....	7.61	8.62[3]	13.44	7.93	7.21	8.87
Birmingham	6.80	7.90	8.85	....	7.06	....	7.08	9.35	....	7.28	6.99	9.10
Boston	7.70	8.81	10.27	45.67	7.96	....	7.83	9.53	14.45	8.13	7.89	9.36
Buffalo	6.80	8.05	9.77	....	7.15	....	7.10	7.90	13.10	7.40	7.15	8.70
Chattanooga	6.95	8.10	8.60	....	7.20	....	7.20	9.18	....	7.45	7.25	9.05
Chicago	6.80	8.09	8.50	49.05	7.06	....	7.08	7.75	12.85	7.28	6.99	8.46
Cincinnati	6.92	8.08	8.90	46.10	7.30	....	7.32	8.05	13.09	7.75	7.28	8.71
Cleveland	6.80	8.09	8.85	49.16	7.16	....	7.14	7.85	12.91	7.61	7.16	8.63
Detroit	6.99	8.28	8.78	43.50	7.34	....	7.36	8.04	13.05	7.75	7.27	8.65
Erie, Pa.	6.80	7.90	8.85	....	7.15	....	7.08	7.85	....	7.40	7.15	8.63
Houston	7.85	8.75	10.49	....	8.15	....	8.25	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.10	8.20	9.20	....	7.40	....	7.40	9.44	....	7.60	7.45	9.30
Los Angeles	8.05	10.00	11.00	....	8.35	....	8.05	11.25	14.25	8.30	8.05	10.25
Milwaukee	6.89	8.18	8.59	....	7.15	....	7.17	7.94	12.94	7.45	7.08	8.55
Moline, Ill.	7.15	8.28	8.85	....	7.41	....	7.43	8.10	....	7.63	7.34	....
New York	7.46	8.68	9.44	44.95	8.07	....	7.96	9.48	13.28	7.99	7.76	9.19
Norfolk, Va.	7.25	....	....	....	7.65	....	7.65	9.50	....	7.95	7.45	8.95
Philadelphia	7.14	8.42	9.35	45.98	7.67	9.02	7.64	8.46	13.16	7.74	7.37	8.69**
Pittsburgh	6.80	8.09	9.20	49.00	7.16	....	7.08	7.85	12.85	7.28	6.99	8.46
Portland, Oreg.	7.80	8.80	10.65	....	8.00	....	7.95	11.80	15.00	7.85	7.75	9.60
Richmond, Va.	7.00	....	9.47	....	7.65	....	7.70	8.85	....	7.95	7.20	9.10
St. Louis	7.09	8.38	9.19	43.89	7.35	....	7.37	8.14	13.14	7.68	7.28	8.75
St. Paul	7.46	8.59	9.16	....	7.72	....	7.74	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35	....	8.05	11.20	14.25[3]	8.25	8.05	10.25
Seattle	8.55	10.40	10.80	54.00	8.65	....	8.35	11.70	14.60	8.30	8.20	10.10
Spokane	8.55	11.00[7]	10.80	....	9.05	....	8.35	11.80	15.35	8.30	8.20	10.60
Washington	7.50	8.79	7.97	....	8.12	....	8.08	9.09	....	8.40	7.68	9.34

Prices do not include gage extras; †prices include gage and coating extras (based on 12.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **¼-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [2]—500 to 9999 lb; [3]—400 to 999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.



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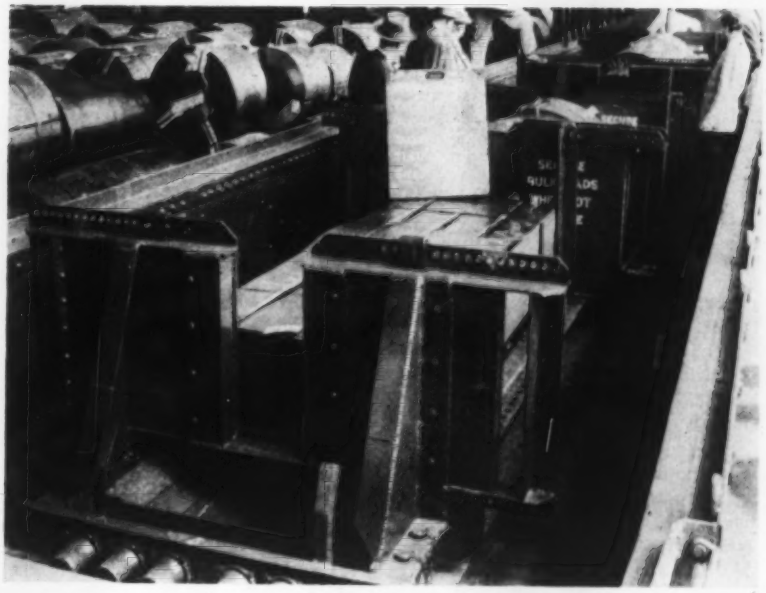
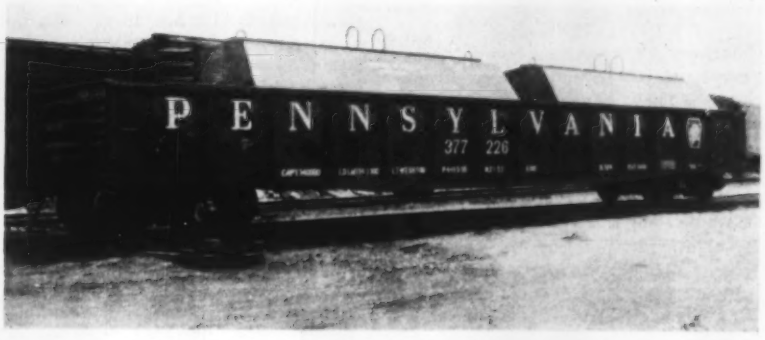


New railroad loading skids hold both coil and sheet



Protective covers are shown in place on gondola car

Steel Shipping Costs Cut

"SAVINGS to the consumer should run about $70 for a full carload of steel." That's how Russell R. Clark, traffic manager for Republic Steel Corp., Cleveland, sums up advantages of the new gondola loading devices being put into service by the Pennsylvania, Chesapeake & Ohio, Nickel Plate, New York Central and other major railroads.

Railroads are pushing the new equipment in an attempt to win back business lost to trucks. It eliminates special wrapping and handling charges (averaging about 5 cents per 100 lb) which steel mills have had to charge on rail-hauled steel sheet and coils. Sheet and strip comprise about 38 per cent of total steel shipments this year.

Planned Performance—Co-ordinated by the Association of American Railroads, the program has been going on since early spring. All major steel-hauling roads have been running trial models under a service proving system. Though no final design will be established, units being put into service will:

1. Eliminate blocking, dunnage and wrapping.
2. Reduce loading and unloading time.
3. Protect steel shipments from the weather.

Details—The Pennsylvania's device is used with standard open cars. It consists of floating skid units (two to a car) which will handle either sheet or coil steel. Design prevents load shifting without blocking.

A removable sheet steel cover is provided for each skid, covering top, ends and sides of the load. Wrapping paper protection is unnecessary. Covers have loops set in the top for easy crane handling. They are insulated and louvered to prevent condensation on the inside and can be stacked during loading or unloading operations.

Acceptance — The Pennsylvania started with 15 of these cars. It expects to have 65 soon. Twenty-eight are in service on the Nickel Plate; the New York Central is expecting its first deliveries this month; and the Chesapeake & Ohio has 25 in service and will add more as demand warrants.

Plates . .

Plate Prices, Page 108

Inquiry for plates is running well in excess of production, with consumers showing increasing interest in first quarter tonnage. One eastern mill has opened books for that delivery, and another may do so shortly. In general, however, the mills are expected to get more current on fourth quarter commitments before taking on new obligations. One eastern producer, in fact, only recently started accepting November shipment tonnage, deferring action on later commitments until deliveries are in better balance with shipment promises.

The Claymont, Del., producer is having some operating difficulty. It scarcely got the larger of its two mills into production recently, after a suspension of several weeks for repairs, when the same mill had another breakdown. It will be back in operation some time this week. This maker is not likely to be much interested in first quarter bookings until it gets its rolling schedules adjusted again.

The railroads and carbuilders continue to exert heavy pressure. The bulk of tonnage sought for the fourth quarter will not be obtainable until after the turn of the year. Shipyard demands are creeping upward, with the probability that needs will be substantial in the first and second quarters of next year.

While Chicago plate sellers note some easing in tight supply conditions, area mills think general improvement is doubtful so long as demand holds at the present high level. All forms of heavy construction are booming, but, except for welded pipe, there is no indication production is being lost for lack of plates. At Pittsburgh, though, users of wide plates are having difficulty getting enough steel to com-

plete projects before the end of the building season. Tonnage promised for October delivery has been pushed back to November and December in some cases. Mill carry-over tonnage in plates matches that in cold-rolled sheets, running a month or more.

Plate mills booking on a monthly basis are under heaviest pressure from fabricating shops taking spot contracts in New England. Some of this work is on the borderline of defense, and, in some cases, consumers are able to wangle tonnage.

Steel Bars . . .

Bar Prices, Page 108

Despite the blanking out of some tonnage in fourth quarter production schedules to care for overflow orders from the third quarter, producers of hot-rolled carbon bars are so oversold they will likely enter the first quarter, next year, with arrearages of three to four weeks.

Barmakers, generally, are delaying formal opening books for first quarter business until they can determine exactly what the carry-over will be at end of the year. One eastern mill shortly may open books for January tonnage. Indications are sellers will, more or less, follow the policy of accepting business on a month-to-month basis until such time as supply and demand are in better balance.

Fabricators continue to report their hot bar suppliers are still cutting fourth quarter allotments. Alloy bar tonnage, however, is available for delivery this year, though schedules are reported filling up, especially on the smaller sizes.

No letup in demand is in evidence. It would take quite a lull in buying to make much impression on mill operations because demand is so greatly in excess of supply. Inquiry for first quarter is developing rapidly.

Tin Plate . . .

Tin Plate Prices, Page 110

The last-minute rush to speed tin plate shipments to consumers before the Oct. 1 price rise, announced in August, had the tin mills in the Pittsburgh and adjoining areas working beyond theoretical capacity last week. Heavy order backlogs made it impossible to complete all shipments before the deadline.

Fourth quarter is expected to see larger tonnage placed than had been expected during the summer. Volume, however, will likely be below that of the third quarter, which was stimulated by the efforts to beat the price increase. Integrated mills can divert to other products any extra ingot tonnage resulting from a slowing down in tin mill operations.

Wire . . .

Wire Prices, Pages 110 & 111

Wiremakers anticipate virtual capacity operations through the remainder of this year, and prospects for the first quarter of next year are promising. Some mills report substantial orders for that delivery period are being received.

Chicago district mills say users of manufacturers wire items, such as springmakers and the heavy industries, are projecting strong manufacturing schedules through November. At the same time, sales of merchant products are expected to quicken—there has been some concern because of the long drouth, but good fence sales are said to be in prospect.

Jobbers of merchant wire items have hesitated to build heavy inventories. They have been depending on quick replacement tonnage. But mills may not be able to give as prompt service as they require in the future. As a result, there is increasing disposition on the part of nail sellers to increase stocks somewhat.

In general, the wire mills are booking substantial order volume for first quarter shipment. No letdown in automotive, spring, heading or high carbon specialty requirements is noted. Pressure is stronger in the East with consumers more disposed to place forward shipment tonnage. Many users apparently are not satisfied with their inventory position and are trying to build stocks.

Wire mill carry-overs are not so heavy as in most other carbon products, except in the case of a few New England mills that suffered considerable flood damage. Rod mill capacity is reported sold out through remainder of this year and lead time on finished wire grades is noticeably more extended.

New England producers' backlogs extend well through remainder of the year on the larger tonnage grades and high carbon specialties. Flood damaged mills are still handicapped, more in finishing departments than in steelmaking. A serious factor is damage to wire in process. District producers say a new output record will be established this year in upholstery wire for bedding coils.

Pittsburgh Steel Co. plans to diversify the range of welded wire fabric it produces to meet the growing demand for a diverse assortment of wire fabric from construction and other industries. Additional facilities will be installed at the Monessen, Pa. mill.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 109 & 110

"Our unshipped orders for finished steel products are now at a new high point. We expect our current capacity operations to continue through this year and well into 1956."

That comment of Avery C. Adams, president, Pittsburgh Steel Co., Pittsburgh, about sums up thinking among sheet producers. They are expecting some reduction in automotive requirements next year but anticipate capacity production of sheets and strip at least through the first quarter. President Eisenhower's illness caused some uncertainty, but, in general, no particular change in business conditions is seen in the months immediately ahead.

Buyers are pressing for first quarter tonnage. They will not get all they request. Books have been opened by some of the producers for that delivery position. St. Louis mills, which opened a few days ago, report their books are filling rapidly. In New England, consumers are placing some tonnage for that shipment. All makers, however, are not making commitments, delaying the formal opening of books until they can better judge their likely carry-over at year end.

Currently, consumers are receiving substantial tonnage from the mills, though not all they would like. Surprisingly, in view of the stringency in supply, there has been relatively little so-called gray market steel around. This possibly is explained by the fact little foreign material has been coming into the country.

Demand for cold-rolled sheets is relentless at Chicago where the pressure is expected to mount as fourth quarter auto assembly accelerates. Wide hot-rolled sheets are in almost as tight supply as cold rolled. Deliveries of electrical, enameling and galvanized sheets are extended. In St. Louis, September sheet order volume was off but only because of restricted bookings by the mills to permit them to catch up with carry-over tonnage. Few, if any, sellers of flat-rolled will be current with deliveries by year end. So far as can be determined, only cold-rolled carbon strip is available for shipment

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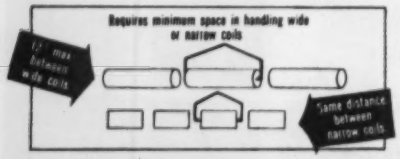

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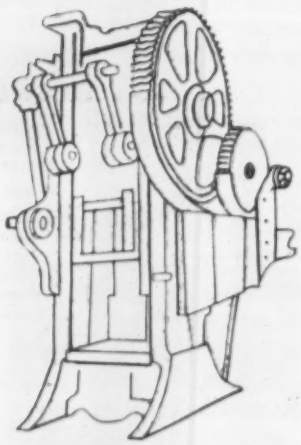

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this year. Converters in New England have openings in December schedules.

Republic Steel Corp., Cleveland, has issued revised extra books on hot-rolled carbon sheets, 18 gage and heavier, cold-rolled carbon sheets and hot-rolled carbon strip. The new lists are dated Sept. 27. Changes are minor, largely involving quality extras.

Warehouse . . .

Warehouse Prices, Page 113

Warehouse steel inventories continue the slow decline shown throughout the year. One leading distributor in the East estimates a drop of about 10 per cent in September.

Plates are almost as tight as structurals, with low stocks extending from wide flange beams to smaller angles and channels. Large carbon rounds and some alloy bars also are tightening. Bottlenecks are being encountered in processing departments.

Higher nickel grades of stainless are being rationed.

In the St. Louis district, stocks are spotty and broken sizewise. Balance is the chief problem confronting distributors there. Plates and structurals are tight, but oversupplies are reported in light, flat-rolled products. Some sizes of tubing are plentiful; others, scarce.

Warehouse business in September ran about the same as in August, possibly a shade better. Trading would have been more active if inventories had been larger and better balanced.

Los Angeles distributors report that prices on most steel items will increase in the fourth quarter. This would push quarterly profits to a yearly high, even if an anticipated lag in district sales materializes.

Tubular Goods . . .

Tubular Goods Prices, Page 112

Only a few small sizes of pipe can be ordered for fourth quarter shipment, reports the sales manager of a major Pittsburgh producer of a wide range of tubular products. Consumers' fourth quarter demands for seamless tube in large sizes, line pipe and oil country tubular goods are beyond his company's capacity to produce. Standard pipe and tube specialties appear to be sold out for the fourth quarter.

Producers in the Pittsburgh area are taking no first quarter orders, except for some special products. They may be forced to push back some unfilled orders into the first quarter next year, cutting down ton-

nage available for new business in that period.

Normally, large producers of tubular goods open first quarter order books in mid-November. This year, however, with the delivery situation acute, they may postpone order book opening for several weeks.

New England pipe distributors, buying for replacement, are increasing their orders slightly, with deliveries more extended, except on buttweld. Shipment of the latter can be made in about five weeks, including galvanized pipe. Deliveries on alloy tubing, stainless and specialties, including mechanical pressure tubing, extend well through the fourth quarter. Demand for mechanical tubing is stronger and substantial requirements for antifriction bearings are maintained. Seamless pipe in the larger sizes is being booked for first quarter shipment. Shipments of large diameter electric-weld pipe are more extended due to limited plate supply.

Cast iron pipe demand, following a brief lull, again is more active in the Pacific Northwest. Fourth quarter business is expected to be much better, and may be above normal. Last week, Portland, Oreg. placed an order for 937 tons.

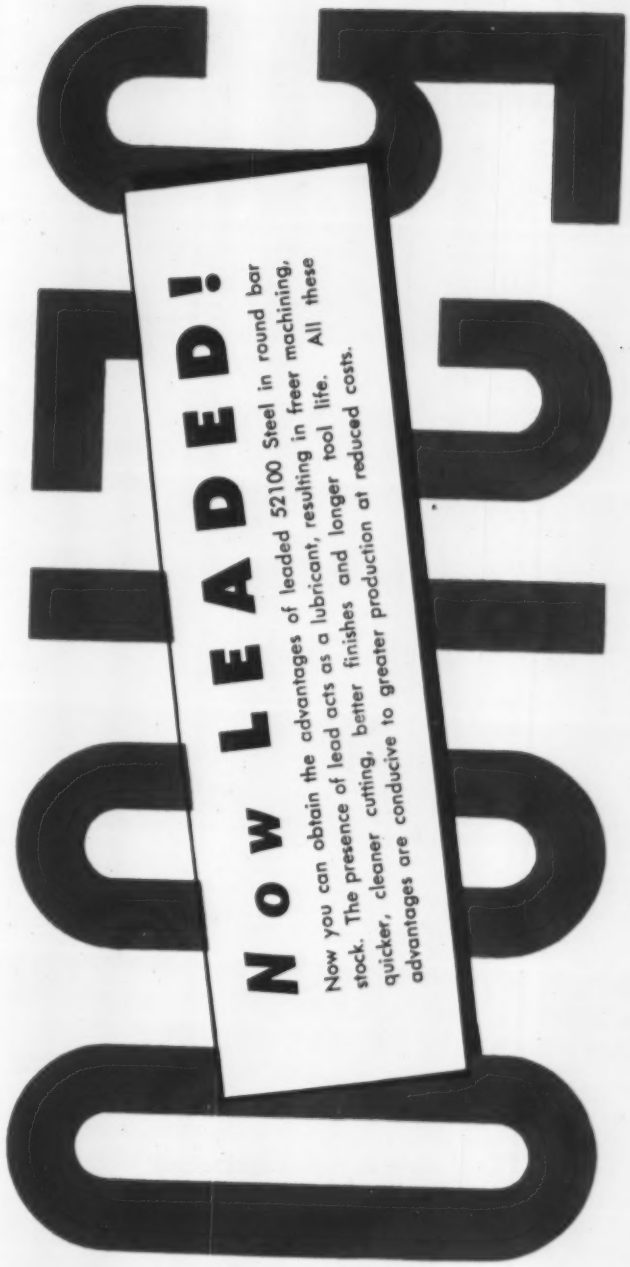
Structural Shapes . . .

Structural Shape Prices, Page 108

Seasonal influences are likely to be more in evidence in the structural steel market from here on. Up to the present, they have not been felt. In fact, there is still a tremendous volume of new work before the market, including bridge and road construction, a diversity of commercial and public building, as well as apartment and office structures. Industrial construction is not so active, but there is more of it than was expected earlier in the year, and there is enough work of this nature to make itself felt at various fabricating centers, notably Pittsburgh.

Fabricators' delivery promises are well extended—in the East as much as six and seven months in some cases (allowing for an exceptional job that might be taken for earlier shipment where it happens to fit in well with shop schedules). Contributing to the extended deliveries, of course, is the fact that fabricating shops are not able to obtain enough plain material to keep their plants operating full at all times. Some eastern shops can't do better than four days a week.

Light flange sections are especially scarce, and indications are there will be no relief on this score over the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55-3

PETERSON STEELS, INC.

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Ores

Lake Superior Iron Ore
(Prices effective for the 1956 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$10.40
Old range nonbessemer	10.25
Mesabi bessemer	10.25
Mesabi nonbessemer	10.10
Open-hearth lump	11.25
High phosphorus	10.00

Eastern Local Iron Ore
Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore
Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	24.00-26.00

Tungsten Ore
Net ton unit, before duty

Foreign, wolframite, good commercial quality	$33.50
Domestic, scheelite, mine	63.00

Manganese Ore
Mn 48%, nearby, 95c-$1.05 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 75c-80c.

Chrome Ore
Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $45.00-$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	32.00

Domestic
Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.00

Antimony Ore
Per unit of Sb content, c.i.f. seaboard

56-60%	$3.50-$3.75
60-65%	3.75-3.90

Vanadium Ore
Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)
High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.
Super-Duty: St. Louis, $150.

Silica Brick (per 1000)
Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawston, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.
Super Duty: Hays, Sproul, Hawston, Pa., Warren, Windham, O., Athens, Tex., $145; Morrisville, Pa., Niles, O., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)
Clearfield, Pa., $139; Philadelphia, $125; Woodbridge, N. J., $122.

Insulating Fire Brick (per 1000)
2300° *F:* Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)
Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)
50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $194; Danville, Ill., $197.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $241; Danville, Ill., $244.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Clearfield, Pa., $286.

Sleeves (per 1000)
Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)
Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $286.

Runners (per 1000)
Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)
Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)
Domestic, dead-burned, bulk, ½-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅝-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton
Beehive Ovens

Connellsville, furnace	$13.25-$14.00
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$25.50
Camden, N. J., ovens	25.00
Everett, Mass., ovens	
New England, deld.	*27.05
Chicago, ovens	25.75
Chicago, deld.	27.25
Terre Haute, Ind., ovens	25.50
Milwaukee, ovens	26.25
Indianapolis, ovens	25.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
Painesville, O., ovens	26.25
Cleveland, deld.	28.18
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.75
Buffalo, deld.	27.00
Lone Star, Tex., ovens	19.50
Neville Island, Pa., ovens	25.00
Philadelphia, ovens	25.00
Swedeland, Pa., ovens	25.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	25.00
Detroit, ovens	26.25
Detroit, deld.	27.25
Pontiac, deld.	27.81
Saginaw, deld.	29.33

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	36.00
Toluol, one deg.	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Ammonium sulphate	$42-$45
Birmingham area	42.00†

†With port equalization against imports.
Cents per pound, producing point
Phenol: Grade 1, 14.00; Grade 2-3, 13.50; Grade 4, 15.50; Grade 5, 14.25.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $25.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length (Inches)	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5¼	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

remainder of this year. In fact, no appreciable improvement in structural supply is seen by trade leaders until the first quarter of next year.

Reversing a trend of long standing, bids on bridge tonnage in New England are exceeding engineers' estimates. Structural shops with substantial order backlogs, and lacking plain material to cover requirements in most cases, are less willing to bargain and give way to price pressure. Ton for ton, the large volume of structurals required for Connecticut bridges will go at substantially higher prices than prevailed on the 60,000 tons placed for the Massachusetts turnpike.

On the West Coast, the structural market outlook is promising for the fourth quarter, except for a shortage of steel items usually supplied by eastern mills. Structural sales in the area during the first nine months of this year are reported to be almost double those in the like period a year ago.

New work being estimated includes three Texas tower radar islands, bids to the First Naval District, Boston, taking about 6500 tons. The first tower platform, now in place in the Atlantic, was built by Bethlehem Shipbuilding Division, Quincy Yard. For emergency spans, 14 Bailey bridges have been placed in Massachusetts.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 120

Pittsburgh Steel Co. has awarded Koppers Co. Inc. a contract for design and construction of a 19-oven coke battery with auxiliary equipment at its Monessen, Pa. works. The new battery will increase coal carbonizing capacity of the plant 25 per cent, or 144,000 tons annually. The 74 ovens now operated at that point and the new ovens will provide annual capacity of 624,000 tons. Construction of the battery will be completed by June, 1956.

Pig Iron . . .

Pig Iron Prices, Page 113

Pig iron bookings are gaining. Although September business showed some betterment, it did not quite come up to expectations. Sellers are confident of good improvement in October, but whether the uptrend will be accelerated substantially is still a question.

Gray iron foundries in the Midwest view business prospects over the balance of the year as good. Most shops are operating 40 hours a week

(Please turn to page 125)

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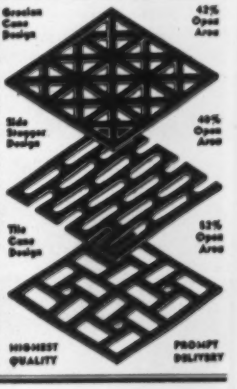

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Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 21.85c per lb of contained Mn, packed, carload 22.9c, ton lot 24.5c, less ton 25.7c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 11.2c per lb of alloy. Packed, c.l. 12.2c, ton 12.65c, less ton 13.65c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 26.25c per lb of contained Cr; c.l. packed 27.5c, ton lot 29.25c, less ton 30.65c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 31.75c per lb contained Cr, 0.02 max 38.50c, 0.03 max 38c, 0.06 max 36.50c, 0.1 max 36c, 0.15 max 35.75c, 0.2 max 35.50c, 0.5 max 35.25c, 1.0 max 34c, 1.5 max 33.85c, 2.0 max 33.75c. Ton lot, add 3.1c, less ton add 4.8c. Carload packed add 1.45c. Delivered. Spot add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. 8 M x D, bulk 27.4c per lb contained Cr. Packed c.l. 28.7c, ton 30.5c, less ton 32c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carloads, packed 8 M x D, 19.6c per lb of alloy, ton lot 20.85c; less ton lot, 22.05c, delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05c per lb of contained Cr; 1" x down, bulk 39.8c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.2% min, Fe 0.2 max) Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.25 per lb, ton lots $1.27, less ton lots $1.28. Delivered. Spot add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.33 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.75c per lb of contained Si. Packed, c.l. 13.85c, ton lot 15.3c, less ton 16.95c. F.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., and Portland, Oreg., Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5c per pound contained silicon. Packed, c.l. 16.2c, ton lots, 18c; less ton, 19.35c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4c per lb of contained Si. Packed c.l. 17.05c, ton lot 18.7c, less ton 19.95c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si. Packed, c.l. 19.95c, ton lot 21.35c, less ton 22.4c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 98% Si, 0.75% max Fe, 0.07 max Ca). C.l. lump, bulk, 20.5c per lb of Si. Packed, c.l. 21.95c, ton lot 23.25c, less ton 24.25c. Add 0.5c for max 0.03 Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lots packed 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 8.5c, per lb of alloy. Packed, c.l. 9.5c, ton lot 10.65c, less ton 11.5c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 27.4c, less ton 28.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22c per lb of alloy, carload packed 23.05c, ton lot 24.95c, less ton 25.95c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5c per lb of alloy, carload packed 22.95c, ton lot 25.25c, less ton 26.75c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.95c per lb of briquet, carload packed in box pallets 17.15, in bags 17.85c; 3000 lb to c.l. in box pallets 18.35c; 2000 lb to c.l. in bags, 19.05c; less than 2000 lb in bags 19.95c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.1c per lb of briquet, c.l. packed, pallets 12.3c, bags 13.1c; 3000 lb to c.l., pallets, 13.5c; 2000 lb to c.l., bags, 14.3c, less ton 15.2c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.7c per lb of briquet, c.l. packed, pallets, 12.9c; bags 13.7c, 3000 lb to c.l., pallets, 14.1c; 2000 lb to c.l., bags, 14.9c; less ton 15.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.75c per lb of briquet; packed, pallets, 6.95c; bags, 7.75c; 3000 lb to c.l., pallet, 8.55c; 2000 lb to c.l. bags 9.35c; less ton 10.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.9c. Packed, pallets 7.1c; bags 7.9c; 3000 lb to c.l. pallets 8.7c; 2000 to c.l. bags 9.5c; less ton 10.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.45 per lb of contained W; 2000 lb W to 5000 lb W, $3.55; less than 2000 lb W, $3.67, delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.80-$6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, deld.; less ton lots $4.70.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carloads packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, c.l. packed, ⅛" x 12 M, 18.5c per lb of alloy, ton lots 19.65c, less ton 20.9c. Deld. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18.5c per lb of alloy, ton lots 19.65c; less ton lots 20.9c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 17.2c per lb of alloy; ton lots 18.7c; less ton lots 19.95c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 16.50c. Packed c.l. 17.50c, 2000 lb to c.l. 18.50c, less than 2000 lb 19c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Bigio, Tenn. $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.46 in all sizes except powdered which is $1.57; Washington, Pa., furnace, any quantity $1.46.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.25 in cans; in bags, $1.24, f.o.b. Langeloth, Pa.; Washington, Pa. $1.24.

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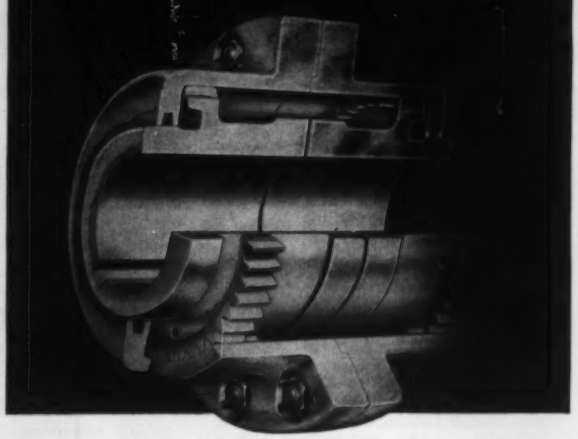

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(*Concluded from page* 120)

or better; order backlogs range from a minimum of three weeks to a maximum of six months. Operations in the Chicago district average about 85 per cent of capacity.

In the East, foundry operations are definitely improved. Foundry coke shipments, which are regarded by some interests as a more accurate gage of business than the movement of pig iron, are the highest in that district in possibly six months. Activity in the import and export markets is nil.

Contributing to the heavier demand for pig iron are higher prices on foundry scrap.

Pig iron supplies in the St. Louis district have caught up with local demand. Bookings have been restricted largely to regular customers. This is permitting Granite City Steel Co. to stockpile sufficient tonnages to satisfy customers' needs during the projected shutdown of one of its two blast furnaces in January for relining.

Scrap . . .

Scrap Prices, Page 126

Pittsburgh—Large purchases of No. 1 heavy melting steel continue lacking. Despite the dullness, the market is considered strong with traders anticipating high-level fourth quarter steelmaking operations. Stainless steel scrap demand is extremely strong, with sales of 18-8 bundles and solids reported as high as $285 a ton. Cast iron grades have rallied from the mid-September decline and are quoted, on the average, $1 a ton higher.

Boston—District steelworks have resumed buying steel scrap, paying $37, shipping point, within the $5 freight area, or 50 cents higher than the going price on scrap destined for eastern Pennsylvania. For dock, export, $38 is offered for No. 1 steel and bundles. Sheared low phos grade of steel is quoted at $39, shipping point, for district consumption. Shipments of No. 2 steel grades are largely to eastern Pennsylvania; also No. 1 busheling.

New York—Brokers have advanced their buying prices for prime open-hearth grades of scrap to $41-$42. They are offering to pay $32-$33 for No. 2 bundles. Prices for mixed borings and turnings have been stepped up to $21-$22; low phos structural and plate, to $42-$43. Business is good, both on domestic and export account. The market undertone is strong.

Buffalo—Steady tendencies prevail in the local scrap market. Dealers report sufficient supplies are available to meet recent commitments. Prices are unchanged.

Chicago—The stronger tone which has been developing in scrap has broken through consumer resistance to higher prices and nearly all important grades are up about $2 a ton. For some railroad specialties, the increases are as much as $3 to $4 a ton. The upsurge also carried cast iron grades up $1 to $3 a ton. Market bullishness has embraced dealer material which for some time has been of little interest to steelmakers.

Philadelphia—Most grades of steel scrap are strong, but prices are unchanged. The Fairless Hills, Pa. consumer recently bought a limited tonnage of No. 1 grade heavy melting, bundles and busheling at $47, delivered, the same price it paid previously. This left the market unchanged on these grades at $46-$47. It is estimated that the mill's latest purchase involved about 10,000 tons, less than the 15,000 tons of No. 2 bundles it had bought a couple weeks previously.

Low phos structurals and plate are higher at $49-$50, delivered, the outside price applying to the shorter

(*Please turn to page* 128)

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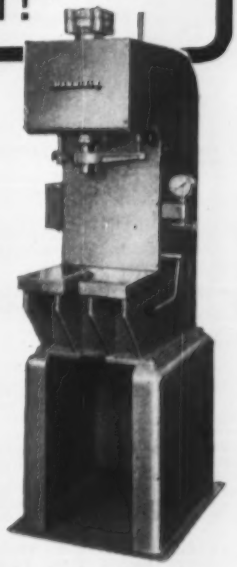

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Sept. 28	$45.00
Sept. 21	44.33
Aug. Avg.	43.97
Sept. 1954	29.94
Sept. 1950	40.93

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer's plant)

No. 1 heavy melting..	43.00-44.00
No. 2 heavy melting..	39.00-40.00
No. 1 bundles	43.00-44.00
No. 2 bundles	35.00-36.00
No. 1 busheling	43.00-44.00
Machine shop turnings	29.00-30.00
Mixed borings, turnings	29.00-30.00
Short shovel turnings..	32.00-33.00
Cast iron borings	32.00-33.00
Cut structurals, 3 ft lengths	49.00-50.00
Heavy turnings	42.00-43.00
Punchings & plate scrap	49.00-50.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades

No. 1 cupola	*42.00-43.00*
Charging box cast	*38.00-39.00*
Heavy breakable cast	*38.00-39.00*
Unstripped motor blocks	29.00-30.00
No. 1 machinery cast	*46.00-47.00*

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
Rails, 2 ft and under..	54.00-55.00
Rails, 18 in. and under	55.00-56.00
Rails, random lengths..	51.00-52.00
Railroad specialties....	53.00-54.00

Stainless Steel Scrap

18-8 bundles & solids	*270.00-285.00*
18-8 turnings	*130.00-140.00*
430 bundles & solids	*100.00-110.00*
430 turnings	60.00-65.00

CLEVELAND

(Delivered consumer's plant)

No. 1 heavy melting..	43.50-44.50
No. 2 heavy melting..	32.00-33.00
No. 1 bundles	43.50-44.50
No. 2 bundles	29.00-30.00
No. 1 busheling	43.50-44.50
Machine shop turnings	23.00-24.00
Mixed borings, turnings	27.50-28.50
Short shovel turnings..	27.50-28.50
Cast iron borings	27.50-28.50
Low phos.	45.00-46.00
Cut structural plates 2 ft and under	47.00-48.00
Alloy free, short shovel turnings	31.00-32.00
Electric furnace bundles	43.50-44.50

Cast Iron Grades

No. 1 cupola	47.00-48.00
Charging box cast	40.00-41.00
Stove plate	46.00-47.00
Heavy breakable cast..	37.00-38.00
Unstripped motor blocks	29.00-30.00
Brake shoes	35.00-36.00
Clean auto cast	48.00-49.00
Burnt cast	37.00-38.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
R.R. malleable	51.00-52.00
Rails, 2 ft and under..	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths..	50.00-51.00
Cast steel	46.00-47.00
Railroad specialties....	52.00-53.00
Uncut tires	47.00-48.00
Angles, splice bars	53.50-54.50
Rails, rerolling	60.00-61.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	275.00-280.00
18-8 turnings	130.00-140.00
430 clips, bundles, solids	90.00-100.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer's plant)

No. 1 heavy melting..	46.00-47.00
No. 2 heavy melting..	35.00-36.00
No. 1 bundles	46.00-47.00
No. 2 bundles	32.00-33.00
No. 1 busheling	46.00-47.00
Machine shop turnings.	24.00-25.00
Short shovel turnings..	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	46.00-47.00
Electric furnace bundles	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00

CHICAGO

No. 1 heavy melting	*44.00-46.00*
No. 2 heavy melting	*36.00-37.00*
No. 1 factory bundles	*46.00-47.00*
No. 1 dealer bundles	*43.00-44.00*
No. 2 bundles	31.00-32.00
No. 1 busheling	*44.00-46.00*
Machine shop turnings.	29.00-30.00
Mixed borings, turnings	29.00-30.00
Short shovel turnings	*31.00-32.00*
Cast iron borings	*31.00-32.00*
Cut structurals, 3 ft	*47.00-48.00*
Punchings & plate scrap	*48.00-49.00*

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Stove plate	37.00-38.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	51.00-52.00
Drop broken machinery	51.00-52.000

Railroad Scrap

No. 1 R.R. heavy melt.	47.00-48.00
R.R. malleable	*54.00-55.00*
Rails, 2 ft and under	*59.00-60.00*
Rails, 18 in. and under	*60.00-61.00*
Angles, splice bars	*56.00-57.00*
Rails, rerolling	*65.00-66.00*

Stainless Steel Scrap

18-8 bundles & solids	290.00-300.00
18-8 turnings	160.00-170.00
430 bundles & solids	100.00-105.00
430 turnings	45.00-50.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	40.00
No. 2 heavy melting..	30.00
No. 1 bundles	40.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	23.50
Mixed borings, turnings	23.50
Short shovel turnings	25.50
Punchings & plate scrap	45.50

Cast Iron Grades

Charging box cast	32.00
No. 1 cupola	39.00
Stove plate	32.00
Heavy breakable	32.00
Unstripped motor blocks	22.00
Clean auto cast	42.00
Malleable	35.00

BIRMINGHAM

No. 1 heavy melting...	36.00-37.00
No. 2 heavy melting...	32.00-33.00
No. 1 bundles	36.00-37.00
No. 2 bundles	28.00-29.00
No. 1 busheling	36.00-37.00
Cast iron borings	17.00-18.00
Short shovel turnings..	26.00-27.00
Machine shop turnings.	23.00-24.00
Electric furnace bundles	37.00-38.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.50-48.00
Stove plate	44.50-45.50
Bar crops and plate...	42.00-43.00
Structural plate, 2 ft...	41.00-42.00
Unstripped motor blocks	36.00-37.00
Charging box cast	28.00-29.00
No. 1 wheels	38.00-39.00

Railroad Scrap

No. 1 R.R. heavy melt.	42.00-43.00
Rails, 18 in. and under	*56.00-57.00*
Rails, rerolling	53.00-54.00
Rails, random lengths..	50.00-51.00
Angles, splice bars	50.00-51.00

PHILADELPHIA

(Delivered consumer's plant)

No. 1 heavy melting...	46.00-47.00
No. 2 heavy melting...	40.00-41.00
No. 1 bundles	46.00-47.00
No. 2 bundles	37.00-39.00
No. 1 busheling	46.00-47.00
Electric furnace bundles	47.50
Machine shop turnings.	28.00-28.50
Mixed borings, turnings	27.00-28.00
Short shovel turnings ..	30.50-31.00
Structurals & plate	*49.00-50.00*
Heavy turnings	42.00
Couplers, springs, wheels	51.00
Rail crops, 2 ft & under	58.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Malleable	*58.00*
Heavy breakable cast..	45.00-46.00
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*41.00-42.00*
No. 2 heavy melting..	37.00-38.00
No. 1 bundles	40.50-41.50
No. 2 bundles	*32.00-33.00*
Machine shop turnings.	20.00-21.00
Mixed borings, turnings	*21.00-22.00*
Short shovel turnings..	22.00-23.00
Low phos. (structural & plate)	*42.00-43.00*

Cast Iron Grades

No. 1 cupola	34.50
Unstripped motor blocks	25.00-26.00
Heavy breakable	38.00-39.00

Stainless Steel

18-8 sheets, clips, solids	280.00-285.00
18-8 borings, turnings	150.00-160.00
430 sheets, clips, solids	115.00-120.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	36.00-37.00
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	35.50-36.50
No. 2 bundles	*26.50-27.50*
Machine shop turnings.	18.50-19.00
Mixed borings, turnings	21.50-22.00
Short shovel turnings..	22.50-23.00
No. 1 cast	30.00-31.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast.	35.00-36.00

BUFFALO

No. 1 heavy melting...	38.00-39.00
No. 2 heavy melting..	35.00-36.00
No. 1 bundles	38.00-39.00
No. 2 bundles	32.00-33.00
No. 1 busheling	38.00-39.00
Mixed borings, turnings	28.00-29.00
Machine shop turnings.	26.00-27.00
Short shovel turnings..	29.00-30.00
Cast iron borings	29.00-30.00
Low phos.	45.00-46.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-41.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths.	47.00-48.00
Rails, 2 ft and under.	51.00-52.00
Railroad specialties....	48.00-49.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting ..	40.00-41.00
No. 2 heavy melting...	34.00-35.00
No. 1 bundles	40.00-41.00
No. 2 bundles	31.00-32.00
No. 1 busheling	40.00-41.00
Machine shop turnings.	26.00-27.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings..	29.00-30.00
Cast iron borings	23.00-24.50
Low phos., 18 in.	47.00-48.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Heavy breakable cast..	38.00-39.00
Charging box cast	38.00-39.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt	43.00-44.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths..	49.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	36.50
No. 2 heavy melting..	34.00
No. 1 bundles	36.50
No. 2 bundles	29.50
Machine shop turnings	*27.00*
Short shovel turnings..	27.00

Cast Iron Grades

No. 1 cupola	*46.50*
Charging box cast	39.00
Heavy breakable cast..	36.00
Unstripped motor blocks	35.00
Brake shoes	36.00
Clean auto cast	46.00
Stove plate	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	*46.50*
Rails, 18 in. and under	55.00
Rails, random lengths	*50.50*
Rails, rerolling	*64.00*
Angles, splice bars	*51.50*

SEATTLE

(Delivered consumer's plant)

No. 1 heavy melting	*39.50*
No. 2 heavy melting	*35.50*
No. 1 bundles	*35.50*
No. 2 bundles	*30.50*
No. 3 bundles	19.00
Machine shop turnings.	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings..	15.00-16.00
Electric furnace, No. 1.	42.00-44.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	35.00
Heavy breakable cast..	30.00
Unstripped motor blocks	29.00
No. 1 wheels	35.00
Stove plate (f.o.b. plant)	25.00
Brake shoes	28.00-29.00

Railroad Scrap (Delivered consumer's plant)

Rails, random lengths..	33.00

LOS ANGELES

No. 1 heavy melting..	32.00
No. 2 heavy melting..	30.00
No. 1 bundles	32.00
No. 2 bundles	*27.00*
Machine shop turnings.	10.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	43.00-45.00

SAN FRANCISCO

No. 1 heavy melting..	34.00
No. 2 heavy melting..	32.00
No. 1 bundles	34.00
No. 2 bundles	29.00
No. 1 busheling	34.00
Machine shop turnings.	14.00
Mixed borings, turnings	14.00
Short shovel turnings..	16.00
Cast iron borings	16.00
Cut structurals	36.00
Heavy turnings	14.00
Punchings & plate scrap	34.00

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

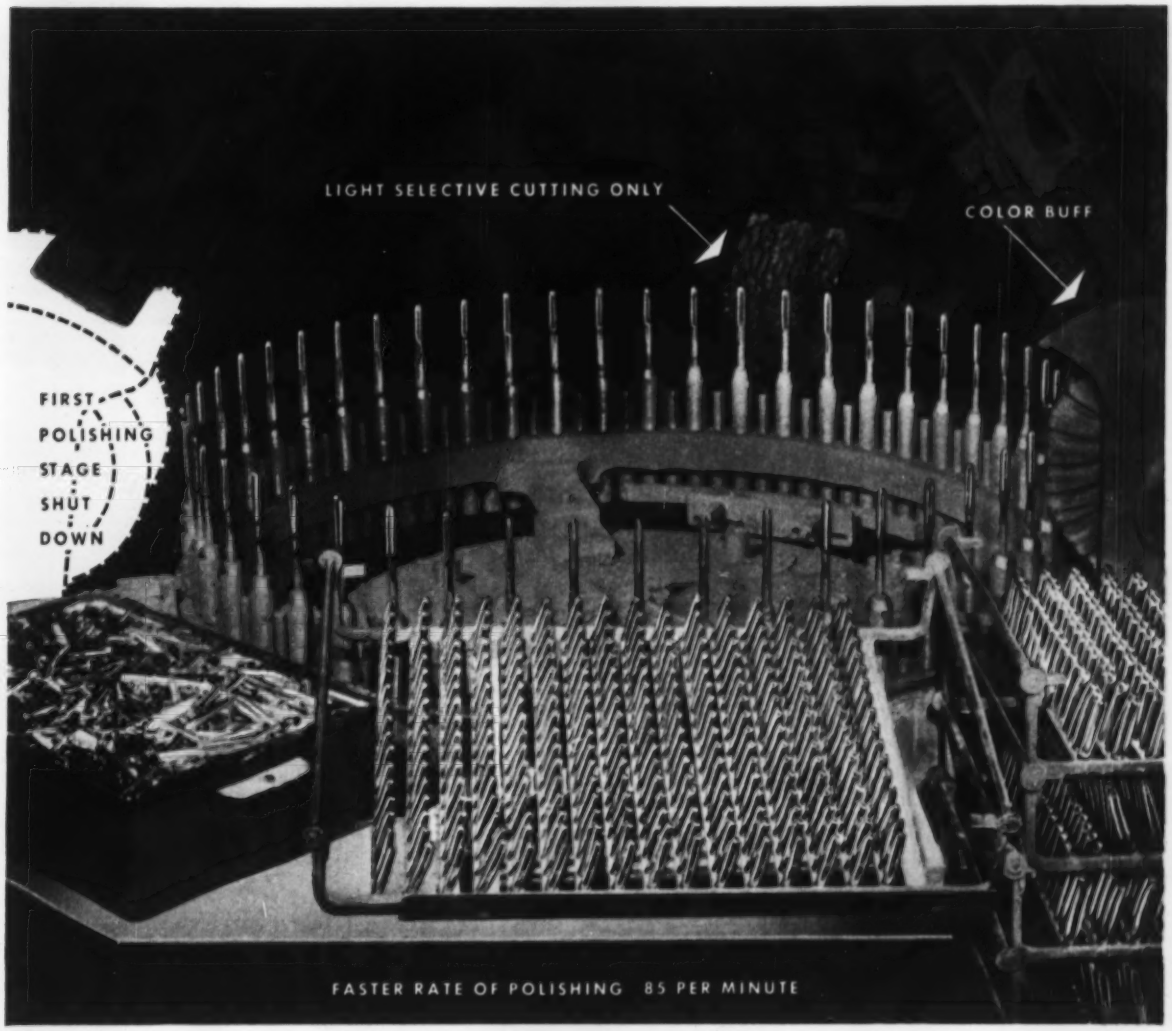
(Delivered prices)

No. 1 heavy melting..	38.50
No. 2 heavy melting..	35.50
No. 1 bundles	38.50
No. 2 bundles	32.50
Mixed steel scrap	32.50
Mixed borings, turnings	17.00
Rails, remelting	47.50
Busheling, new factory: Prepared	36.50
Unprepared	32.50
Short steel turnings ..	21.00

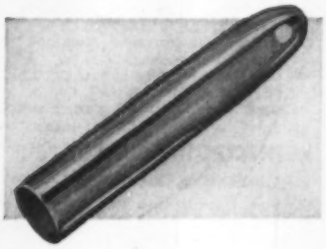
Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.



How Formbrite cuts polishing costs 40% for JARCO



Pens, pencils, and lipstick cases have to be attractive to sell—yet they must be able to take a beating in daily use. The Jarco Metal Products Co., which specializes in drawing metal parts for these and such other products as miniature flashlight cases, and similarly formed products, tried Formbrite,* Anaconda's new drawing brass, shortly after it was announced to the trade.

Superior polishing characteristics combined with excellent drawing properties, plus hardness and scratch resistance, sounded ideal for Jarco products. Formbrite has proved an excellent pressroom material. The uniformity of temper from batch to batch eliminated shutdowns for adjustments in their battery of 12-plunger Waterbury-Farrel presses, which can produce up to 500,000 pieces a day.

It's in the polishing room where Formbrite has really paid off. Jarco uses 50- and 98-spindle continuous-loop machines having two cutting stages and a final color buff stage. The first cutting stage is shut down completely. The second stage is used for only a partial or selective cut in certain areas of the cap—because of the extremely deep draw. The color buff stage does most of the work. The savings in polishing run about 40%, according to David Roberts, vice president.

Formbrite is a premium product at a nonpremium price. Find out for yourself how its superfine grain, excellent drawing properties, strength, and scratch resistance can help you make a better product at lower cost. Write for Publication B-39. Better yet, ask about a sample or a trial batch. Write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

Formbrite

FINE-GRAIN DRAWING BRASS

an ANACONDA® product

made by

The American Brass Company

(*Concluded from page 125*)

lengths, 2-ft and under. Cast iron scrap is especially strong, with malleable higher at $58, delivered.

On the major grades of steel and cast scrap, yards are moving tonnage out about as fast as it is received. Demand for steel scrap for export is steady.

Detroit — Scrap iron and steel prices are unchanged. The market undertone is described as firm. District steel ingot operations last week were estimated at 98 per cent of capacity. This compares with 95 per cent the week preceding, and 75 per cent in the corresponding week a year ago.

Seattle—Heavy melting steel advanced $4.50 a ton last week to $39.50 for No. 1, $35.50 for No. 2, $35.50 for No. 1 bundles and $30.50 for No. 2 bundles. Heavy local consumption and strong export demand are underlying market factors which have forced prices up $6.50 a ton in the last four weeks. Japan is hungry for scrap, and because of low wages in the Orient, Japanese buyers can outbid domestic scrap users for tonnage in spite of high trans-Pacific freight rates.

Cleveland — Although representative sales are lacking, the scrap market in this area and the Valley continues to display strength. Prices are holding firm on all grades. Increased foundry activity is reflected in stronger demand for the cast grades. The tight supply situation in rail crops is resulting in stronger foundry demand for plate scrap.

Cincinnati — The scrap market turned dull here as brokers and dealers awaited the closing of industrial lists.

St. Louis—Scrap continues strong, especially the railroad grades. Rail items are up $1 to $2.50 a ton despite unusually large offerings. The mills last week purchased 5100 tons of railroad scrap as well as 14 locomotives listed by the L. & N. railroad. A smaller amount listed by the Frisco also was taken. An offering of 60 cars of melting steel by the Missouri-Pacific brought no softening in prices.

Birmingham — Dealers are busy filling orders received early in September. They report specialty items are in short supply, more than carload lots bringing premium prices. No. 2 bundles, however, are plentiful, and some brokers who overbought in anticipation of demand from outside the district are holding up shipments for domestic accounts. Cast grades are in short supply, but prices are steady.

Los Angeles—Prices on No. 2 bundles climbed $2 a ton to $27 last week, but anticipated widespread price increases failed to materialize.

San Francisco—Exporters are paying $3 a ton above domestic prices for steel scrap. Local mills report pressure for higher offering prices is increasing. Open-hearth operations in this area are estimated at about 90 per cent of capacity.

Iron Ore . . .

Iron Ore Prices, Page 120

The lake fleet hauled 3,088,812 gross tons of iron ore in the week ended Sept. 26, reports the Lake Superior Iron Ore Association. This brought the season's movement to 65,791,437 tons, more than 16 million tons above cumulative shipments in the like period of the 1954 shipping season, and only 11 million tons behind the record movement in like period of 1953.

A multimillion dollar concentrating mill at Kaiser Steel Corp.'s Eagle Mountain, Calif., mining facilities is expected to raise the shipping grade of ore from 55 per cent iron to over 60 per cent. The new facilities will supplement a beneficiation plant that went into operation last year. Freight charges, handling costs and over-all costs are expected to be reduced.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

7000 tons, substructure, glass manufacturing plant, Ford Motor Co., Nashville, Tenn., to Ingalls Steel Construction Co., Birmingham, Ala.

6040 tons, contract 7, upper roadway, Queensboro bridge, New York, through Terry Contracting Inc., New York, to Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

6000 tons, engine plant, Ford Motor Co., Lima, O., to Bethlehem Steel Co., Bethlehem, Pa.

2665 tons, Lake county, Indiana Toll Road Commission; bids Oct. 11, Indianapolis.

2650 tons, contract P-7, approach work, Philadelphia-Gloucester bridge, Delaware River Port Authority, Philadelphia, to Mt. Vernon Bridge Co., Mt. Vernon, O.

1600 tons, power plant extension, Tampa Electric Co., Tampa, Fla., to Orleans Materials Supply Co., New Orleans; Stone & Webster Engineering Corp., Boston, engineer-contractor.

1070 tons, plant building, Norton Co., Huntsville, Ala., to Decatur Iron & Steel Co., Decatur, Ala.; Daniel Construction Co., South Birmingham, Ala., general contractor; reinforcing, 70 tons, to Virginia Steel Co., Richmond, Va.

850 tons, state bridge, Nassau county, N. Y., through Hendrickson Bros., general contractor, to Harris Structural Steel Co., New York.

475 tons, plant addition, Armco Steel Corp., Ashland, Ky., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

420 tons, shopping center, Lake Success, Long Island, N. Y., through Walsh Construction Co., general contractor, to Simon Holland & Son Inc., Brooklyn, N. Y.

350 tons, two buildings, School for Social Research, 66 W. 12th St., New York, through H. R. H. Construction Co., general contractor, to Drier Structural Steel Co. Inc., Long Island City, N. Y.

320 tons, substructure, bridges, Galveston-Pelican Islands, Tex., to Mosher Steel Co., Houston; Farnsworth & Chambers Co., Houston, general contractor.

295 tons, shopping center, Roosevelt Field, Long Island, N. Y., through Webb & Knapp, builder, to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, municipal industrial building No. 7, Wilkes-Barre, Pa., to the Wilkes-Barre Iron & Wire Works, that city.

250 tons, addition, Kaiser aluminum plant, Tacoma, Wash., to Pacific Car & Foundry Co., Seattle.

210 tons, Pennsylvania Railroad parking area, 30th St., Philadelphia, through McCloskey & Co., general contractor, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

180 tons, building, Sears Roebuck & Co., Reading, Pa., to the Reading Metalcraft Co., that city.

180 tons, addition, nurses' home and dormitory, Waterbury Hospital, Waterbury, Conn., to Bethlehem Fabricators Inc., Bethlehem, Pa.; W. J. Megin Inc., Naugatuck, Conn., general contractor.

160 tons, gymnasium-auditorium, University of Bridgeport, Bridgeport, Conn., to Leake & Nelson Co., Bridgeport; E. & F. Construction Co., Bridgeport, general contractor.

185 tons, manufacturing building, Downington Paper Box Co., Downington, Pa., to Morris Wheeler & Co., Philadelphia.

125 tons, building, Assumption College, Worcester, Mass., to United Structural Steel Co., Worcester; Granger Contracting Co., Worcester, general contractor.

STRUCTURAL STEEL PENDING

2500 tons, Markland locks and dam, Ohio river, Corps of Engineers, Louisville; also 2000 tons of concrete reinforcing bars, and 1750 tons of wall armor.

1250 tons, state bridges, Boston-Milton, Mass.; A. I. Savin Construction Co., East Hartford, low on general contract.

1200 tons, power plant extension, United Illuminating Co., Bridgeport, Conn.

1000 tons, estimated, County-City building, Tacoma, Wash.; bids soon.

825 tons, contract 37-K, state bridge, Carbon county, Pa.; bids Oct. 11.

425 tons, mostly sheet piling, for harbor repairs, bulkhead, New Haven, Conn.

375 tons, Montana state, Yellowstone river, Stillwater county, 576-ft bridge; also 22 tons of reinforcing; bids to Helena, Mont., Sept. 29.

300 tons, addition, Kaiser aluminum plant, Tacoma, Wash.; bids in Sept. 27.

250 tons, state highway bridges, Canton, Mass.; J. F. White Construction Co., Cambridge, Mass., low on general contract.

205 tons, 2-span continuous girder bridge, Tolland, Conn.; D. Arrigoni, Middletown, Conn., low on general contract.

200 tons, Pennsylvania Railroad bridge, Naanam, Del.; bids Oct. 4.

135 tons, state highway bridge, Colrain, Mass.; Continental Construction Co., Lynnfield Center, Mass., low on general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

800 tons, state bridges, Fox Point interchange, Providence, R. I., to U. S. Steel Supply Division, U. S. Steel Corp., Boston; M. A. Gammino Construction Co., Providence, general contractor.

600 tons, substructures, bridges, Galveston-Pelican Islands, Tex., to Mosher Steel Co., Houston; Farnsworth & Chambers Co., Houston, general contractor.

485 tons, three bridges, interchange, Massachusetts turnpike, West Springfield, Mass., to U. S. Steel Supply Division, U. S. Steel Corp., Boston; Henley-Lundgren Co., Shrewsbury, Mass., general contractor.

200 tons, warehouse, digester plant, machine shop addition, Weyerhaeuser Timber Co., Longview, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle; Howard S. Wright & Co. Inc., Seattle, general contractor.

180 tons, buildings, Assumption College,

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WANTED: PRODUCTION SCHEDULER. Man with steel mill experience to head up scheduling department of a small steel plant engaged in making, rolling, and fabricating steel products. State age, education, experience, and salary expected. Please reply to Box 315, STEEL, Penton Bldg., Cleveland 13, Ohio.

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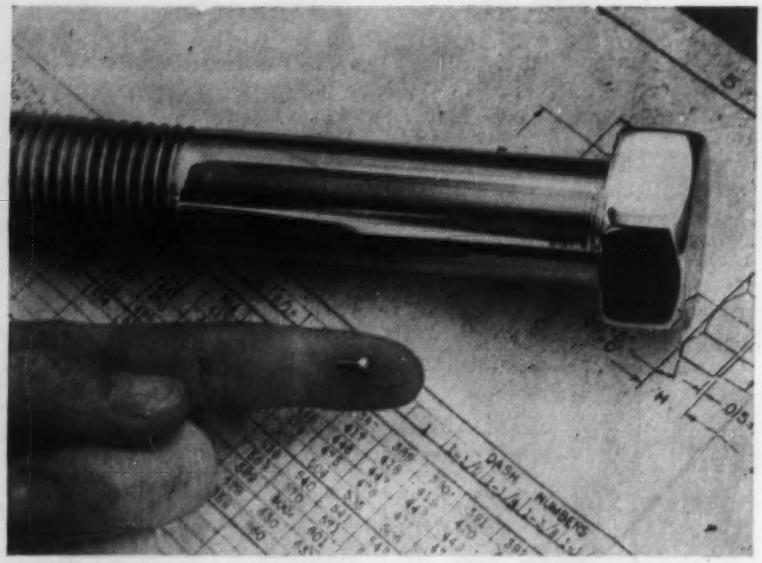

ALLMETAL'S HEX HEAD STOCK spread includes 2-56 x 3/16 cap screw (1/100 oz.), and 1¼-7 x 7½ bolt (a weighty 3 lbs., 1 oz.). Between these two extremes, 497 different hex head bolt sizes are carried in stock.

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Leading manufacturers launched a switch to a fast growing firm (specialists in stainless steel) for their fastener supplies. They found that there's no stock like the largest, and Allmetal Screw Products Company has the largest stock of stainless fasteners in the world.

One significant reason manufacturers find Allmetal stainless fasteners so fascinating is their hex head bolt stock (see cut). And talent to follow through with fast delivery of screws, nuts, washers, rivets, pins, nails, and "AN" fasteners.

Chief cause for Allmetal's ability to turn out fasteners — and have them ready for immediate shipment — is their spanking new plant in suburban New York (Garden City, Long Island). These added facilities — plus 26 years of specialization in tough alloys — give Allmetal the combination to supply stainless fasteners when needed. Stock list brochure available.

MANUFACTURERS SINCE 1929
ALLMETAL
SCREW PRODUCTS COMPANY, INC.
GARDEN CITY NEW YORK

Worcester, Mass., to U. S. Steel Supply Division, U. S. Steel Corp., Boston; Granger Contracting Co., Worcester, general contractor.

121 tons, municipal bridge, Aberdeen, Wash., and Washington state highway project, Grays Harbor county, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

865 tons, New Cumberland locks and dam, Ohio river, Corps of Engineers, Pittsburgh; also 285 tons, embedded metal; 1130 tons, wall armor; 85,400 linear feet, steel bearing piles; and 217,000 sq ft, sheet piling.

605 tons, bridges and structures, Lake county, Indiana Toll Road Commission; bids Oct. 11 to Indianapolis.

269 tons, Washington state undercrossing, Benton county; general award to Hannan Bros., Portland, Oreg., low at $218,536.

140 tons, also 13,685 ft of steel piling, Idaho state Priest river bridge, Boise county, Idaho; bids to Boise Sept. 27.

115 tons, Washington state highway projects, Yakima and Thurston counties; general awards made.

100 tons, two bridges, Tieton river, Washington state; bids to Bureau of Public Roads, Portland, Oreg., Oct. 4.

PLATES . . .

PLATES PLACED

300 tons, digesters for enlarged plant, Weyerhaeuser Timber Co., Longview, Wash., to unstated interest; Harold S. Wright & Co. Inc., Seattle, general contractor.

115 tons, pipe piling, contract 125-B, Harlem river drive improvement, 125th street to 132nd street, New York, through Horn Construction Co., general contractor, to Davidson Pipe Co., Brooklyn, N. Y.

PLATES PENDING

6195 tons, hull steel, Navy; bids in to Navy General Stores Supply Office, Philadelphia; delivery is for east and west yards.

1800 tons, steel piling (if steel is adopted) Weyerhaeuser Timber Co., pump plant, Cosmopolis, Wash.; general award made.

950 tons, three storage tanks, King Salmon, Alaska; bids received Sept. 23 by U. S. Engineer.

500 tons, 5-million-gal water storage tank; bids to Hood River, Oreg., Oct. 3.

350 tons, 3,950,000-gal steel standpipe, Wilmette, Ill.; bids Oct. 4, to village clerk.

100 tons, elevated water tank, Cottonwood, Idaho; bids Oct. 4.

PIPE . . .

CAST IRON PIPE PLACED

637 tons, to U. S. Pipe & Foundry Co., Seattle, by Portland, Oreg.

300 tons, to Pacific States Cast Iron Pipe Co., Portland, Oreg., by Portland, Oreg.

90 tons, 8 and 12 in., for Skagit P.U.D., Mt. Vernon, Wash., to U. S. Pipe & Foundry Co., Seattle.

RAILS, CARS . . .

LOCOMOTIVES PLACED

New Orleans Public Belt, two 1200-hp. diesel-electric switching engines, to the Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 1800 freight cars, with 300 fifty-ton boxcars going to ACF Industries Inc., New York, 500 fifty-ton boxcars to its own shops, and 1000 seventy-ton gondola cars, divided equally between Pullman-Standard Car Mfg. Corp., Chicago, and the General American Transportation Corp., Chicago.

Bangor & Aroostook, 180 pulpwood freight cars, to Magor Car Corp., New York.

Chesapeake & Ohio, 500 seventy-ton hopper cars, to its Russell, Ky., shops.

Chicago, Burlington & Quincy, 28 passenger cars, to the Budd Co., Philadelphia.

Reading, 150 seventy-ton hopper cars, to ACF Industries Inc., New York.

RAILROAD CARS PENDING

Alaska Railroad, 50 flatcars, 70-ton capacity; rebids in to General Services, Seattle.

Advertising Index

Alan Wood Steel Co. 63
Allen-Bradley Co. 17, 18
Allmetal Screw Products Co., Inc. 130
Alloy Metal Wire Division, H. K. Porter Company, Inc. 12
Aluminum Company of America 6
American Brass Co., The 127
American Society for Metals, The 46
Ansul Chemical Co., Fire Equipment Division 13
Armco Steel Corporation 34
Associated Spring Corporation 103

Babcock & Wilcox Co., The, Tubular Products Division 80
Bakelite Co., A Division of Union Carbide & Carbon Corporation 87
Barnes-Gibson-Raymond, Division of Associated Spring Corporation 103
Barnes, Wallace, Co., Division of Associated Spring Corporation 103
Barnes, Wallace, Co., Ltd., The, Division of Associated Spring Corporation 103
Behr-Manning Division of Norton Co. 7
Bethlehem Steel Co. 1, 132
B-G-R Cook Plant, Division of Associated Spring Corporation 103
Bixby, R. W., Inc. 129
Buhr Machine Tool Co. 61
Bullard Co., The 50
By-Products Steel Co., A Division of Lukens Steel Co. 97

Carborundum Co., The 16, 125
Carpenter Steel Co. 129
Cattie, Joseph P., & Brothers, Inc. 122
Cincinnati Shaper Co., The 19
Cleveland Worm & Gear Co., The ..... Inside Back Cover
Colorado Fuel & Iron Corporation, The 20, 21, 27
Continental Steel Corporation 95
Copperweld Steel Co., Steel Division 53
Crucible Steel Company of America 114
Cullen-Friestedt Co. 118
Custom Die Co. 56
Cutler-Hammer, Inc. ..... Back Cover

Diamond Manufacturing Co. 122
Dominion Foundries & Steel, Ltd. 11
Dunbar Brothers Co., Division of Associated Spring Corporation 103

Eastern Machine Screw Corporation, The 122, 129
Eastman Kodak Co., X-ray Division 91
Electric Controller & Mfg. Co., The ..... Inside Front Cover
Electric Equipment Co. 129
Electric Service Co., The 129

Fairfield Manufacturing Co. 10
Falk Corporation, The 92
Fellows Gear Shaper Co., The 85
Freeway Washer & Stamping Co. 122

General Services Administration 67
Gibson, William D., Co., The, Division of Associated Spring Corporation 103
Goodyear Tire & Rubber Co., The, Industrial Products Division 4
Graver Tank & Mfg. Co., Inc. 28
Gray Iron Founders' Society 121

Hannifin Corporation 125

Industrial Products Suppliers 124

Jones & Lamson Machine Co., Machine Tool Division 14, 15
Jones & Laughlin Steel Corporation 77

Kaiser Steel Corporation 129
Kardong Brothers, Inc. 124

La Salle Steel Co. 107
Lewthwaite, T. H., Machine Co., Inc. 122
Lukens Steel Co. 105
Lukens Steel Co., By-Products Steel Co. Division 97

McKay Machine Co., The 45

Macwhyte Co. 3
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 103
Miehle Printing Press & Mfg. Co., Star-Kimble Motor Division 64
Milwaukee Division of Associated Spring Corporation 103
Morgan Engineering Co., The 26

National Metal Exposition & Congress 46
National Steel Corporation 100
Norton Co., Behr-Manning Division 7

Ohio Division of Associated Spring Corporation 103

Peterson Steels, Inc. 119
Pickands Mather & Co. 98
Pines Engineering Co., Inc. 24
Plume & Atwood Manufacturing Co., The 25
Poole Foundry & Machine Co. 124
Porter, H. K., Company, Inc., Alloy Metal Wire Division 12

Rail & Industrial Equipment Co., Inc. 129
Raymond Manufacturing Co., Division of Associated Spring Corporation 103
Republic Steel Corporation 8, 9
Rigidized Metals Corporation 124
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 27
Rotary Electric Steel Co. 68
Ryerson, Joseph T., & Son, Inc. 36

Seaboard Coil Spring Division of Associated Spring Corporation 103
Simmons Machine Tool Corporation 118
SKF Industries, Inc. 2
Sommers Brass Co., Inc. 57
Standard Pressed Steel Co. 22, 23
Star-Kimble Motor Division, Miehle Printing Press & Mfg. Co. 64
Surface Combustion Corporation 82, 83

Teiner, Roland, Co., Inc. 5
Texas Co., The 30
Timken Roller Bearing Co., The, Steel & Tube Division 54
Tinnerman Products, Inc. 58
Toledo Stamping & Manufacturing Co. 124

Union Carbide & Carbon Corporation, Bakelite Co. 87

Washburn Wire Co. 33
Weirton Steel Co. 100
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 20, 21
Worcester Stamped Metal Co. 122

Youngstown Sheet & Tube Co., The 29

Table of Contents, Page 5

Classified Advertising, Page 129

Coming

Oct. 24

IN

STEEL

MARKET FACTS:—

Where to Get and How to Use Them

Worried about market potential, sales territories, methods of distribution, price structure, etc., for your company's new or standard line of products? By combining your own firm's market facts with those available for the asking from outside organizations, you can make the right marketing decisions. STEEL will provide you with an extensive list of sources and will cite concrete examples of how complete marketing facts point the way to greater sales.

Tool Steel Topics

BETHLEHEM STEEL

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

Production Up 50 pct with Bearcat Riveting Tool

For some time a manufacturer had been using a tool made of alloy steel, 2⅛ in. round, to cold-rivet weight-lever sets, 1 7/16 in. sq, for railroad switch stands. The tool was used in a series of rotating blows, average production being 70 pieces per tool before redressing was required.

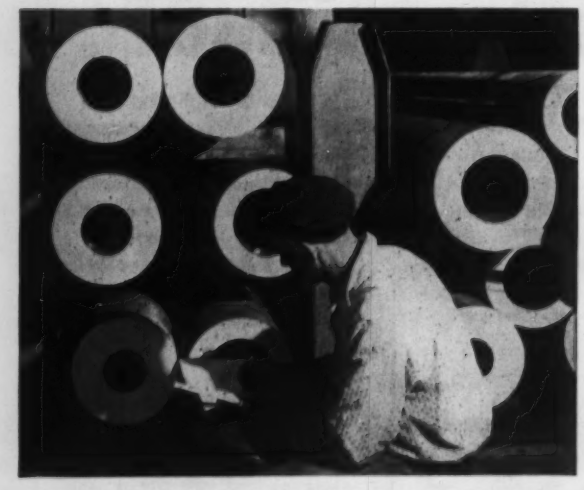
As the operation clearly called for steel with exceptional resistance to shock and wear, we suggested, "Why not give Bearcat a trial on that job? Bearcat's got the toughness you want. What's more, we wouldn't be surprised if it gave enough longer life to bring down your costs."

They made the change, with the result that tool life increased about 50 pct.

Bearcat is a tough, general-purpose grade of air-hardening tool steel. It has exceptional resistance to shock, and superior wear-resistance. Its air-hardening characteristic minimizes quenching hazards, and also provides good resistance to distortion in heat-treatment.

In addition to cold-riveting tools, there are many other applications in which Bearcat gives a good account of itself — in such tools, for example, as chisels, gripper dies, master hobs, hot headers, and die-casting die inserts.

Why not look into Bearcat? You can obtain full information from your Bethlehem tool steel distributor.



Save Time with Hollow-Bar in Ring-Type Applications

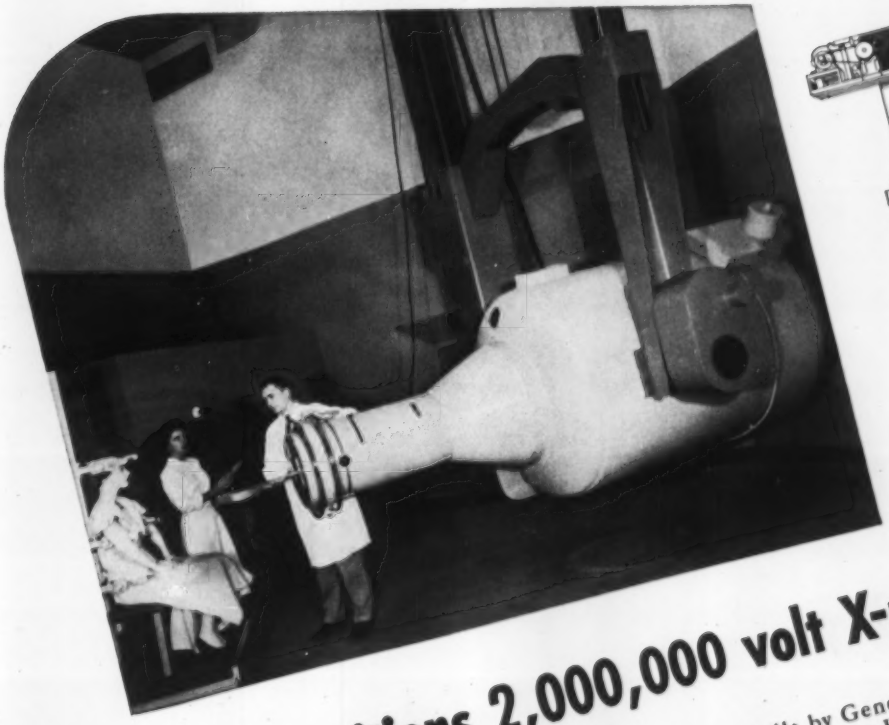
If you use draw rings, hardened bushings, ring dies or the like, you'll find you can save time in the shop with Hollow-Bar Tool Steel. Bethlehem Hollow-Bar comes in two types: BTR (oil-hardening) and Lehigh H (high-carbon, high-chrome). It's made by a high-speed trepanning process, which cores out the inside diameter of hammer-forged or hot-rolled, rough-turned bars. Hollow-Bar goes to work for you immediately. There's no waiting for forged rings or discs — nor are drilling, rough boring or facing, or rough turning required. Just think of the time that saves!

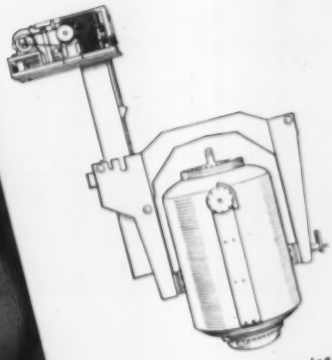
BETHLEHEM TOOL STEEL ENGINEER SAYS:

Here's a Quick Look at Short-Run Dies

There are many types of dies used for blanking or forming where the production required may be only a few hundred pieces, or less. Such requirements occur frequently, as in the aircraft industry, for example. In such circumstances, the normal procedure of machining a die, then heat-treating and grinding it (to produce a die good for millions of parts) is neither practical nor economical. What is desired is a steel which can be machined to size, then used immediately.

One of our standard grades which is ideal for this application is Brake Die Tool Steel. Brake Die comes in rounds, squares and flats. It is a free-machining steel, and has been heat-treated at the mill to the highest hardness possible consistent with good machinability. On forming operations, dies made of Brake Die will last for tens of thousands of parts. And on blanking operations, it will produce anywhere from a few hundred parts to a few thousand, depending of course upon the type of material being blanked, and its thickness.





Close-up of CLEVELAND Series 63F Double Reduction Worm Gear Speed Reducer used to raise and lower this G.E. 2-million volt X-Ray Tube Head.

CLEVELAND positions 2,000,000 volt X-ray machine

QUITE an X-ray machine, this—built by General Electric to serve the New England Deaconess Hospital in Boston, Mass. Quite a job, too, to raise and lower its head—it's heavy, it's delicate, and it has to be positioned accurately. That's why Cleveland was specified to transfer the speed of the motor into slow, smooth and dependable power.

For, with Cleveland worm gear speed reducers, smooth torque flow is assured by virtue of the sliding action of worm on gear. Constant angular velocity assures positive control. Precision matching of case-hardened steel worms to nickel-bronze gears insures 100% dependability.

Experience has demonstrated that a Cleveland actually improves with use. Even when operating under continued severe overloads, danger of sudden failure is remote. Thousands of Clevelands, in fact, operate for the life of driven machines.

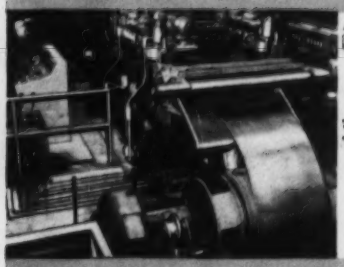
Why not get the complete Cleveland story by writing for Catalog 400 today! The Cleveland Worm & Gear Company, 3270 East 80th Street, Cleveland 4, Ohio.

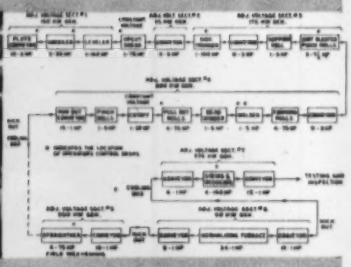
Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Worm Gear
Speed Reducers

the Lone Star Steel *Achievement*★

Over 200 feet of 90" high panels mount C-H Motor Control for Lone Star No. 1 Mill shown above.





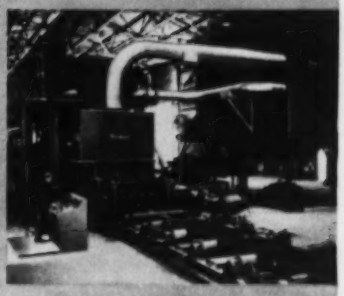
(At left above) Coiled skelp feeds from uncoiler into flattener.

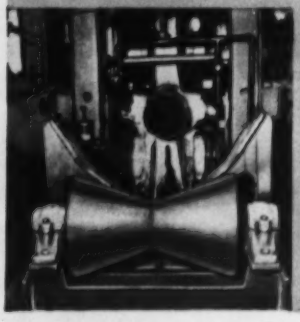
(At right above) Diagram shows sectionalization of Adj. Voltage Drives. AUTOMATION (closed loop control) is found in first 4 sections.

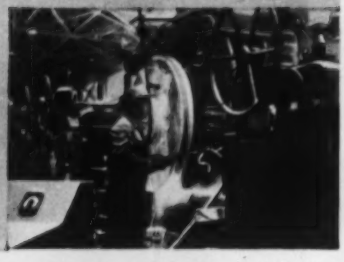
(At right) Blasting machine readies edges of plate for welding.

(At left below) Formed plate emerges from forming mill ready for welding.

(At right below) Largest resistance welder of its type. Wheel electrodes use ignitron contactors.







and the Name on the Motor Control

A gigantic machine is the Yoder Company's No. 1 Pipe Mill at Lone Star Steel. A machine continuously, automatically taking in skelp at one end and pushing it out at the other as completely finished pipe. Never before has pipe of this type from material of this character been continuously electric-weld produced. Never before, the experts agree, has it been possible. Yet fundamentally the individual machines that make up the integrated process are not new. What then is the secret? To a large extent it is found in the motor control that guides and integrates the hundreds of motors, the generators, exciters, alternators and machines on this line. And the secret of the motor control is the name found on that control . . . Cutler-Hammer, pioneer since 1892, constantly blazing new trails that enable machines, processes and mills to reach new highs in performance. Here is a store of experience such as you are likely to find nowhere else and always available to you—whether you plan a new mill installation or simply want to solve a present burdensome application problem.

Look to Cutler-Hammer for the simple, sure solution that means new efficiency, new dependability, new productiveness . . . an installation that goes right to work. Cutler-Hammer experience is as broad as it is long. CUTLER-HAMMER, Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.

★ FIRST electric weld mill making J-55 casing from slit skelp . . . to use flying cutoff on 16" pipe . . . completely conveyorized, automatic from skelp to finished pipe.

CUTLER·HAMMER
MOTOR CONTROL
C-H

LOOK TO CUTLER-HAMMER MILL EXPERIENCE...AS BROAD AS IT IS LONG